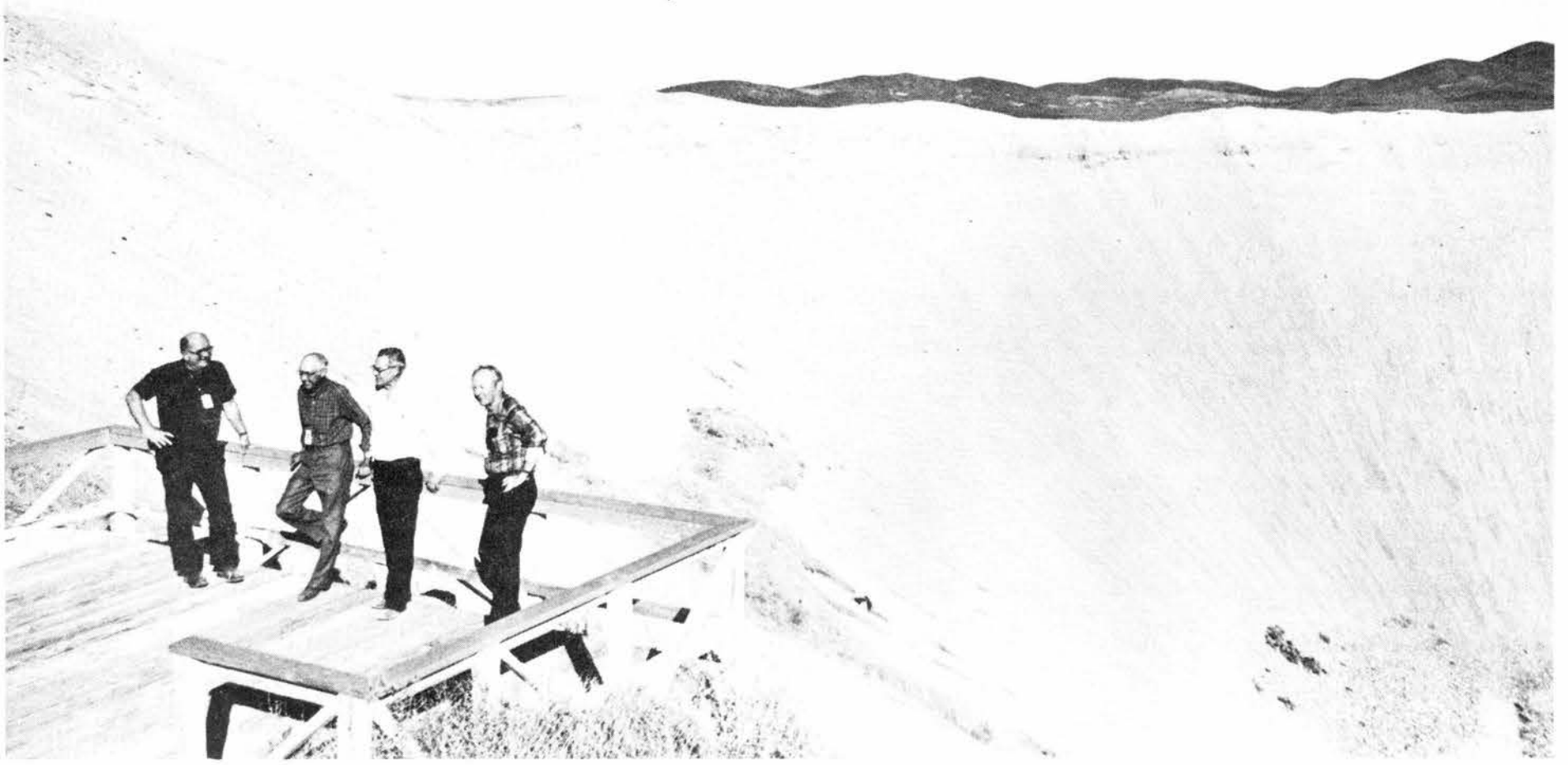
LAB NEWS

VOL. 38, NO. 11 SANDIA NATIONAL LABORATORIES JUNE 6, 1986



SEDAN CRATER has come to symbolize Nevada Test Site. The largest crater at NTS, it was created by a 1962 underground nuclear detonation that was part of the Plowshare program, which was designed to explore peaceful uses of nuclear energy (such as excavating earth for canals and the like). President Welber (second from left) was recently introduced to Sedan Crater, the rest of NTS, and Tonopah Test Range by the Field Engineering organization, including (l to r) Jerry Kennedy, manager of Field Sciences Department 7130; Carter Broyles, director of Field Engineering 7100; and Milo Navratil, manager of Field Instrumentation Department 7120. A special section on Pages Seven through Fourteen shows President Welber touring "Sandia Nevada" and surveys some of the Sandia programs based at NTS and TTR.

Another Sandia?

Where Nuclear Weapons Take Final Exams

We all know "Sandia Albuquerque" and "Sandia Livermore." But there's another one that could be called "Sandia Nevada"—and it's not a mountain range.

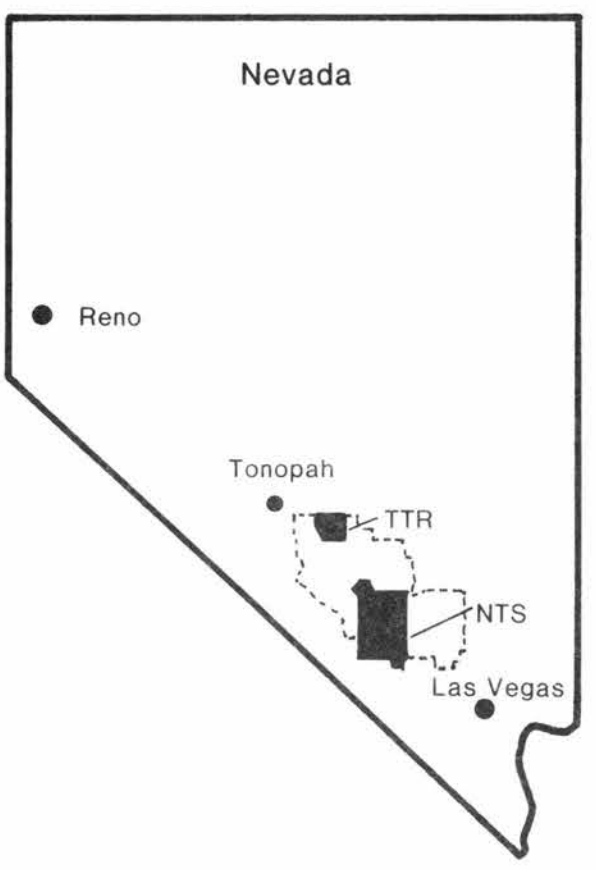
Sandia Nevada is really two sites in that Great Basin state. The sites—Sandia's Tonopah Test Range and the DOE's Nevada Test Site—are 180 miles apart by desert-bounded road (though the nearest corners of the sites lie within 20 miles of each other), but they're unified by both aim and ambience.

The aim, generally, is to subject a nuclear weapon (or a component or subsystem or shape or delivery system thereof) to one or more of the most extreme environments it would be expected to experience if it ever had to be used in the nation's defense. That means, for TTR, missile and artillery projectile firings and recoveries and weapon drop tests from a variety of aircraft. As the TTR folks put it, "One good flight test is worth a thousand expert opinions—and costs a lot less."

It means, for NTS, actual nuclear weapon detonations (all of them underground since the atmospheric test ban treaty of 1963). Weapon effects tests, which are sponsored by DoD's Defense Nuclear Agency (DNA), are part of the specifications for each new weapon system and subsystem in the U.S. stockpile. The test shots provide a realistic — and vital — assessment of weapon component and subsystem reliability. And each one turns up a surprise or two, as the NTS folks can attest.

The ambience, fostered by the deliberate isolation of the two sites and the unique nature of the tasks performed within their boundaries, reflects the camaraderie, *esprit de corps*, and pride that come with being a part of the field test fraternity.

And it is a fraternity, a coeducational one that allows only a relative handful of exceptionally well-motivated, highly talented, and extremely resourceful Sandians to remain active in its ranks. As Jim Plimpton, manager of Field Sciences Department 7110, puts it, "No one gets a degree in bomb testing in college. We're here because we appreciate challenges, and field engineering gives you challenges you can't find in an ordinary laboratory."



SANDIA NEVADA — Both Tonopah Test Range and Nevada Test Site lie have been carved out of the Nellis Bombing Range (dotted line) between Las Vegas and Tonopah. Some 90 Sandians call Vegas home. Sketch by Ken Miller (400)

LAB NEWS accompanied President Irwin Welber on his first tour of Sandia Nevada a couple of months ago. "Because we don't have large numbers of people at either NTS or TTR, those of us based in Albuquerque or Livermore tend to take our Nevada people and projects for granted," he said after the tour. "But that's a mistake. First of all, the work being done out there is vital both to major Sandia programs and to the nation's defense. The Nevada work is, in a sense, the climax of that effort.

"And, second, it's exciting, challenging work. I encourage those Sandians who are looking for new technological horizons, those who enjoy putting their creative talents to the test, to check out the job opportunities in Field Engineering 7100 or in one of the other line organizations that use Nevada as a field test site — weapon development or waste management, for example.

"Finally, I thoroughly enjoyed my visit, and I thank all the Sandians who made my brief stay both pleasant and enlightening. I came away most impressed with the work Sandians are doing at both sites."

In a special center section are photos and stories that reflect the Sandia Nevada world, a world that encompasses both Tonopah Test Range and Nevada Test Site.

Antojitos

The Other Nevada A few months ago Carter Broyles called me to say that his group, Field Engineering, was going to escort President Welber on his first tour of Nevada Test Site and Tonopah Test Range—and would I be interested in coming along?

Well, that's what's known in company journalism as a command performance. But I'd have gone to Nevada most willingly even if Carter hadn't dropped a name or two. I like the place.

Sandwiched between California and Utah, Nevada's an anomaly among states. California can be quite self-conscious about its role as trend-setter, movement-maker, and Yuppie Mecca. Utah's equally self-consciously self-righteous, moral to a fault.

Nevada is matter-of-fact. Oh, Vegas and Reno and Tahoe can be glitzy, but it's just to lure the Californians and the Texans into contributing to the coffers, via the gaming tables. (Yes, Nevadans do become a bit euphemistic on occasion: It's "gaming," not "gambling." Strange word though -- "Did you game last night?" "Oh, yes, I gamed until 4 a.m." Well, after all, some people believe "gambling" is immoral, so change the word, but keep on dealing.)

In general, the state is typified by defining speeding as 70 mph and up; driving 55 to 69 can get you a $5 fine for "wasting a resource" i.e., gasoline.

The urge to drive more than 55 is understandable -- there's a lot of space out there. Which is, of course, one reason that Nevada is the ideal location for the kinds of tests you wouldn't care to conduct in Connecticut.

The other reason is the people -- lots of talented, energetic, dedicated people. And not all of them Sandians. The support that the three weapon labs get from the people at REECo and EG&G and the other contractor groups is vital to our effort out there.

We spent one night at Mercury -- restaurant, bowling alley (Sandia championship tourney underway), motel room -- and, yes, the facilities at Mercury are comparatively posh these days, a far cry from the early 50s and a pretty distant cry from my first trips there in the mid-60s. Mercury may not be either glitzy or beautiful -- but it's a welcome sight after a long day in the tunnels.

In the center pages of this issue are stories and photos that provide some insight into the Nevada the tourist doesn't see, the Nevada that many Sandians work in. They're fascinating places. •BH

* * *

Headline in Nuclear News: "Seventh Topical Meeting on the Technology of Fushion Energy." Gee, maybe Sandia ought to get in on some of these new technologies.

* * *

Nature will tell you a direct lie if she can. —Charles Darwin

Sympathy

To Paul Herrera (7818) on the death of his sister-in-law in Yuma, Ariz., May 26.

To David Gallegos (7818) on the death of his son in Quemado, April 19.

LAB NEWS

Published Fortnightly on Fridays

SANDIA NATIONAL LABORATORIES

An Equal Opportunity Employer

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LIVERMORE, CALIFORNIA
TONOPAH, NEVADA
AMARILLO, TEXAS

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Welcome

Kansas

Leann Adams (6412)
Scott Searls (3718)

For Your Benefit

Re-Enrollment Required For Class II Dependents

Sandia Medical Care Plan Class II dependents who are not re-enrolled during a June 2-27 re-enrollment period will have their coverage discontinued on July 1.

A re-enrollment package has been sent out to all Sandia Medical Care Plan participants known to have Class II dependents. If you have a Class II dependent and have *not* received a package, call Doris Mason (3543) at 505/844-3545.

And what is a Class II dependent? Your unmarried children who are not Class I dependents, your unmarried grandchildren, your brothers and sisters, your parents and grandparents, and your spouse's parents or grandparents. To qualify for coverage, a Class II dependent must have lived with you or in a household provided by you in the vicinity for at least six months, and the total income of the Class II dependent, not counting any support you provide, must be less than $6000 a year from all sources, including Social Security.

TOM SMYLIE, next Community Focus speaker, will give his audience a close-up look at the Sandia Mountains, and talk about ways to become better acquainted with them.

Community Focus Series

The Sandias: Not to Be Taken For Granite

Tom Smylie, Director of Public Affairs for the U.S. Fish and Wildlife Service (Southwest Region), is the next speaker in the Community Focus Series at the Technology Transfer Center on Tuesday, June 17, at noon.

His talk, "The Sandias — Mountains Not to Be Taken for Granted," will provide a close-up view of that rugged mass of rocks we all look at but seldom *see*. Smylie says the Sandias offer as much fascination, beauty, and natural history as any mountain range in the U.S.; they're not "just for looking," as he puts it.

To really appreciate those mountains, it's necessary to *know* them; Smylie will focus on how you can become better acquainted with that familiar landmark to the east. He'll describe the mountains' fascinating geologic and human history, and their abundant plant and animal life.

Have you ever whizzed through an unfamiliar locale on a freeway without stopping to explore some of the side roads and to learn more about what goes on there? Smylie fears that some Albuquerqueans take a similar approach to the Sandia Mountains. Sure, they "head for the cool" on a hot summer day with a picnic lunch, or hit the ski slopes in the dead of winter, but they don't really take time to "smell the roses." This nearby natural treasure becomes much more meaningful, Smylie says, if people spend time seeing, feeling, hearing, and smelling the mountains.

Smylie, a UNM graduate, has spent a great deal of time in the Sandias, both in his present job and his previous one as naturalist and public information officer for the U.S. Forest Service at the Sandia Ranger Station. A well-known naturalist, he has studied birds of prey — primarily eagles and falcons — for more than 27 years.

He also taught science in the Albuquerque Public Schools for six years and worked for the NM Dept. of Game and Fish in Pecos.

Smylie has received numerous national awards and recognition for his nature photography. (He'll show some of his slides during the talk.) He received the "Conservationist of the Year" award in 1971 from ENMU, and the Woodmen of the World Conservation Award in 1977.

Photo Exhibit in Bldg. 911

Bill Gordon *Makes* Photographs

Most hobby photographers are content with snapshots of buddies (or bodies) at the beach, relatives around the Thanksgiving table, maybe a dramatic sunset once in a while.

Bill Gordon (DMTS, 8151), on the other hand, is no snapshooter. He's become so skilled at his hobby that galleries feature his work in one-person exhibitions.

Bill began taking pictures for fun some 40 years ago back in Chicago and kept at it by doing some portrait work during college. Back then, he used a 2-1/4 x 3-1/4 Speed Graphic and a 2-1/4 x 2-1/4 inch (negative sizes) Rollei twin lens reflex camera.

And he's still using large-format view cameras. "Most photographers today have jumped to 35mm cameras because they're so convenient," says Bill. "But I never gave up on the big ones just because they haven't been popular since early in the century.

There's good reason for his loyalty: "I find that, when professionals are competing in galleries, they're using cameras as large as 8x10," he continues. "So, to maintain quality, my negative size has to be no smaller than 4x5.

"I also find that by using the large view camera I work slower, which helps the composition artistically. You give some thought to the scene before setting up a camera this size on a tripod!" Bill also notes that he tends to use up a whole roll of 35mm film in an hour, but "when I'm shooting one large sheet of film at a time, I think more about exposure and composition first."

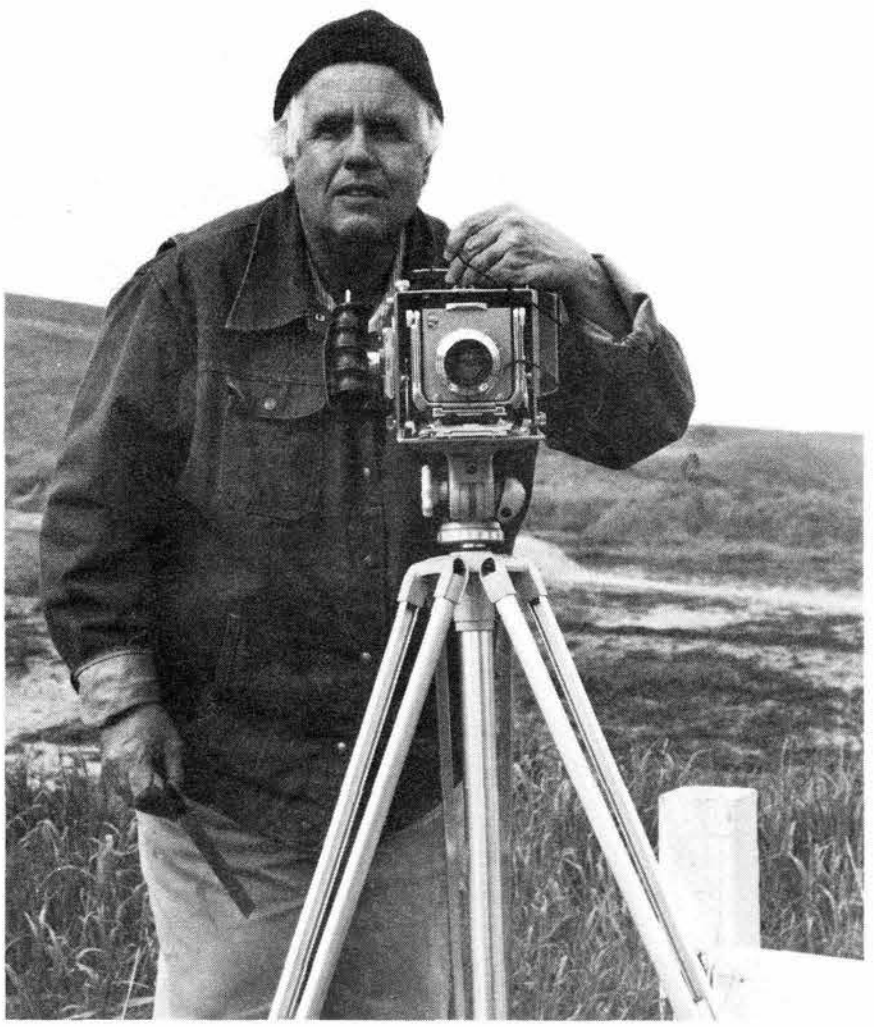
He concentrates on landscapes and architecture for the most part, as his current exhibit (now in the lobby of Bldg. 911) indicates. The same photos were on display at the Amador-Livermore Valley Historical Society museum in Pleasanton a month ago. At an earlier showing of the exhibit, *San Francisco Examiner* art critic Arthur Bloomfield wrote, "Bill Gordon is a lyricist who leaves nature alone." Bill has also exhibited over the years in Carmel, Hayward, San Francisco, Palo Alto, Danville, and Saratoga, as well as in Livermore.

Recently Bill has been experimenting with the techniques of the late Bill Brandt, a noted British photographer whom he admired greatly. Brandt shot with process film — something that results in high contrast images, creating enhanced shadows and high impact black and white distinctions.

Bill has always preferred black and white photography, which he says is more difficult than color "because it requires a translation on the photographer's part — to translate the colors into different shades of gray."

His advice for those beginning in photography is simply to practice: "Take your camera everywhere you go," he emphasizes. "Approach your subject as though you never saw anything like it before. Sure, study the good photographs in books, museums, and galleries. But above all, practice."

Bill's philosophy of photography? This is what he wrote for his current exhibit: "When making a picture, it is my aim to obtain an image which most closely captures my imagination's response to the subject. The joy I experience after momentarily realizing that subject matter is unlimited and I see a new idea, heretofore hidden within the subject, is what art is all about for me."



BILL GORDON (DMTS, 8151) used a mirror propped up in a field to make a self-portrait with his 4x5 Linhof.

Congratulations

Gloria (8315) and Randy Christensen, a son, Ryan Patrick, May 18.

When in Rome . . .

In France, McDonald's offers wine. In the U.K., Kentucky Fried Chicken serves french fries instead of mashed potatoes (and chicken salad in Japan); but KFC never tampers with its "original recipe" coating. In Oman, Church's Fried Chicken calls itself "Texas Fried Chicken" to avoid the religious connotations of "Church's." Mister Donut sells mango muffins in Thailand. Domino's Pizza offers tuna and artichoke toppings in Germany.

Global Marketing Newsletter

SANDIA LIVERMORE NEWS

VOL. 38, NO. 11 SANDIA NATIONAL LABORATORIES JUNE 6, 1986

TEN PARTICIPANTS in the U.S. Department of Commerce Science and Technology Fellowship Program recently visited Sandia Livermore's Combustion Research Facility. Delivering overview briefings were Dick Claassen (8000), far left, and Dan Hartley (8300), right, standing. The Fellows represent such agencies as the Departments of Defense, Agriculture, Transportation, Health and Human Services, and Commerce. The program, established in 1963, provides scientists and engineers in mid-career an opportunity to spend 10 months in policy-level assignments in government or the private sector. Part of their training includes field trips to research, science, and technology facilities.

Supervisory Appointments

TOM PICRAUX (1110)

TOM PICRAUX to manager Ion Implantation and Radiation Physics Research Department 1110, effective April 1.

Tom has participated in ion implantation research since he joined the Labs in 1969. He has a BS in EE from the University of Missouri and a PhD in engineering science and physics from CalTech. In 1965-66 he studied physics at Cambridge under a Fulbright Fellowship.

Tom is a fellow in the American Physical Society and a member of the Materials Research Society, Electrochemical Society, IEEE, and the American Institute of Metallurgical Engineers.

In his spare time Tom enjoys skiing, racquetball, gardening, and traveling. He and his wife Danice have three children and live in the North Valley.

* * *

JUAN RAMIREZ to supervisor Pulsed Power Development Division 1245, effective April 1.

Juan joined the Labs in 1974 as a staff member in the Pulsed Power Development Division. In 1976 he joined the Pulsed Power Application Division where he developed new pulsed power facilities and conducted research on electron-beam-driven high-power lasers. For the last three years he was the project leader responsible for research and development activites in support of the Hermes III accelerator that is being built as part of the new Simulation Technology Laboratory.

Juan is originally from Belize, Central America. He moved to Florida with his family in 1959 after spending four years in Mexico. Juan earned a PhD in nuclear physics in 1970 from the University of Florida. He was a member of the nuclear structure physics research faculty at Western Michigan University from 1970 to 1974. Juan is a member of the American Physical Society.

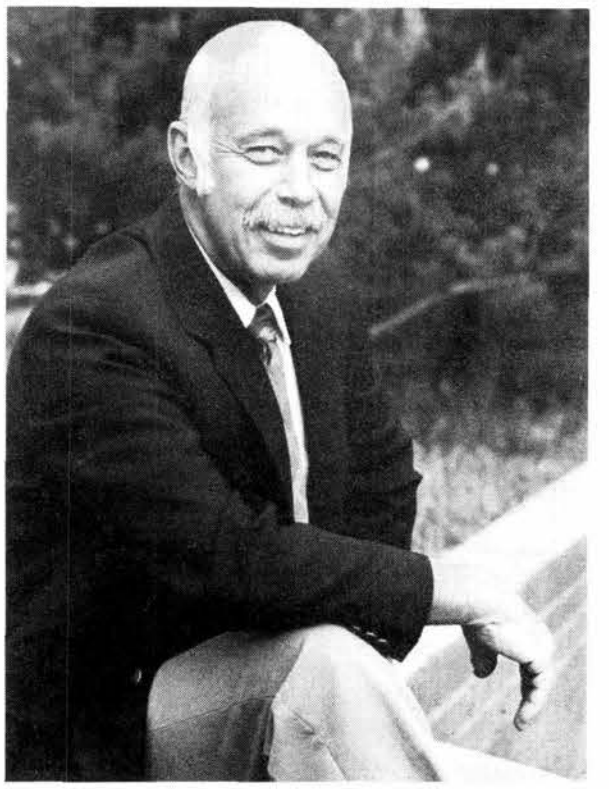
In his spare time, Juan enjoys gardening, racquetball, and woodworking. He and his wife Linda have two children and live in the NE Heights.

* * *

BILL HARTMAN (DMTS) to supervisor of Special Projects Division 5214, effective May 16.

Bill joined the Labs in 1957 as a member of the technical staff in the Systems Analysis Division. In 1962 Bill joined the Field Test organization where he worked on a nuclear weapons effects simulator and on acoustic imaging. He joined the Engineering Analysis Department in 1970 where he worked on X-ray vulnerability analysis, interior ballistics, and transportation accident analysis. In 1981 Bill transferred to the Safeguards organization and has been involved in nuclear proliferation studies and, for the past four years, in an explosive containment project.

He has a BS in engineering physics from South Dakota State University and an MS in physics from UNM. He is a member of the American Physical Society.



BOB SONNENBERG (7210)

In his spare time Bill is active in church organizations and enjoys athletics and reading. He and his wife Jean have two children and live in the NE Heights.

* * *

DON JEROME to supervisor of Security Plans and Audits Division 3432, effective April 16.

Don joined the Labs in 1969 as a member of the Security Standards Division. In 1982 he transferred to the Systems and Appraisal Division. He returned to Security Standards Division in 1984 as a staff security planner.

Don received a BS in political science and an MS in political science and public administration from the University of Idaho. Don was a member of the Boise, Idaho, Police Department for 11 years. He then worked with county court rehabilitation programs in northern Idaho. From 1963 to 1967 Don taught Police Science and Criminal Justice classes at Washington State University. From 1967 to 1969 he was acting Chairman of the Police Science and Criminal Justice Department.

Don's hobbies include rug weaving, basket weaving, and yarn pottery. He and his wife Thisbe have four children and live in the NE Heights.

* * *

BOB SONNENBERG to manager Military Liaison Department 7210, effective May 16.

Bob joined the Labs in 1957 as a member of the Weapons Systems Development organization. He has worked in all areas of that organization during his 28 years at the Labs. Bob became supervisor of the B-61 Bomb Test Division in 1978. In 1979 he joined the Aircraft Compatibility Division as supervisor.

He has a BS in EE from the Illinois Institute of Technology. In his spare time Bob grows open pollinated flint corn and enjoys bow hunting. He and his wife Ingrid live in the South Valley.

* * *

JUAN RAMIREZ (1245), BILL HARTMAN (5214), DON JEROME (3432)

Congratulations

Sharon (2813) and Michael (315) Fletcher, a son, Mark Steven, April 18.

April and Jay (3533) Sanchez, a son, Robert Justin, April 24.

Rhonda (2825) and Perfecto Garcia, a daughter, Randi Lynn, April 26.

Ruth Nance (3531) and John Bertin (1652), married in Albuquerque, May 10.

Margie and Luis (7252) Hernandez, a daughter, Camelia Louisa, May 18.

Terry and Richard (1124) Blake, a daughter, Alandra Lise, May 28.

HANDS ACROSS AMERICA included a block-long contingent of Sandians, organized by Pat Trellue (5255), right. Husband Ron (5252) is on her right. Many other Sandians were scattered along Central or along I-40 east or west of Albuquerque.

Patent Awarded for Label Reader

Preventing the theft of nuclear materials is currently one of the chief concerns of DOE and the nuclear weapons complex.

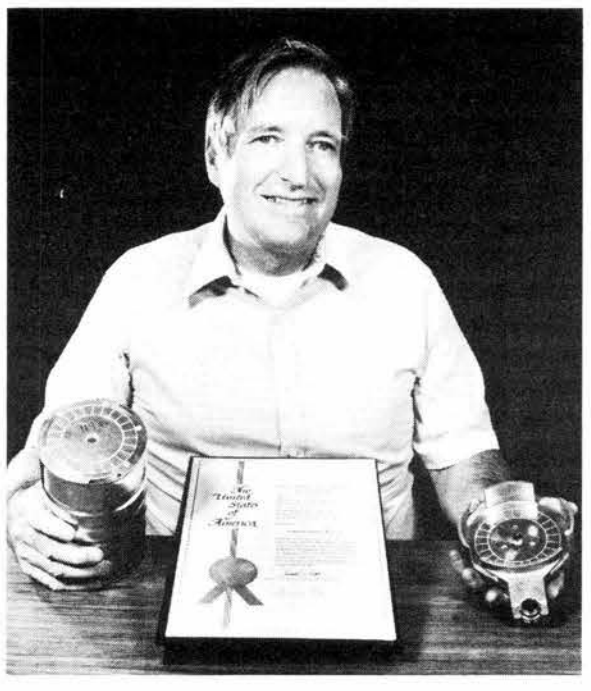
Given that fact, it should come as no surprise that the storage and protection of special nuclear materials (SNM) such as uranium and plutonium rate a lot of attention these days.

Duane Arlowe (5261) has come up with a new system that provides identifying labels for SNM containers and a capacitive label reader that allows remote monitoring at SNM storage sites. A patent on the label reader has been granted to DOE in Duane's name.

SNM must be sealed in air-tight containers that are fairly small. In fact, a common SNM container is the 46-oz. can used for tomato juice at your grocery store. SNM cans are stored in secured vaults and periodically inventoried to ensure the presence of all material, and to check for bulging containers that could cause contamination if they eventually ruptured. Occasionally, inspectors open a random sample of containers for actual material verification.

In 1979 DOE's Office of Safeguards and Security initiated a program to improve SNM accountability in storage vaults, with emphasis on real-time accountability and reduced radiation exposure for the inspectors. Broad goals of the OSS program were to provide the following capabilities: (1) sense the presence of SNM containers at each identifiable shelf position, (2) verify contents by measuring a material property, and (3) allow for future additional capabilities. Duane went to work on the problem; the result was his new monitoring system.

"Since SNM containers don't provide radiation shielding, the previous inventory procedures [on-site physical inspections] used up much of the inspectors' allowable safe-exposure [to radiation] limits," says Duane. "The new system allows remote shelf monitoring — and thus more safety for the monitoring people."



DUANE ARLOWE (5261) demonstrates his recently patented shelf monitoring system for special nuclear materials. The SNM container in his right hand has a special label consisting of 24 1-cm-square foil pads affixed to the bottom. The container is placed atop a label reader (right) at the storage location. Container label "messages" — on temperatures, excessive container bulge, presence sensing, etc. — travel to corresponding output pads on the reader via electrostatic signal.

Besides improving safety, Duane's shelf monitoring system uses presence switches under each SNM container; the switches are continually monitored by a high-speed alarm scanner. If the scanner detects anything out of the ordinary, e.g., movement of a can from its recorded position, it alerts a guard station or material accountability computer.

The system records container and ambient temperatures, providing data to calculate container heat generation if desired. It also checks for excessive container bulge, and reads a special capacitive foil label affixed to the bottom of each SNM container.

The label consists of a circular pattern of 24 1-cm-square foil pads. The pads are connected in binary fashion to either positive or negative pulse pickup rings that are coupled capacitively to corresponding pulse output pads on the shelf monitor (label reader).

Label "messages" thus travel from the label to the reader — mounted at the storage location — via electrostatic signals. This label information, along with the bulge and presence switch data and temperatures, is then routed through shielded cables to a microprocessor-controlled data multiplexing system for analysis.

The system monitors the presence of every container many times each second so that security personnel may respond immediately to a missing container. Also, complete inventories can be taken on demand or at periodic intervals at the rate of about 600 containers per minute.

Until Duane invented the monitoring system, no system permitted remote monitoring of a particular can at a particular location.

Larry Predika (5261) did the microprocessor programming and alarm interface design for the system, and John Dink (5245) was responsible for much of the logistics and simulation work.

Take Note

Jack Walker (6420) received the Texas A&M University College of Engineering Alumni Honor Award for Distinguished Service in Engineering at an award ceremony held May 9. The alumni award program was established in the College of Engineering to recognize the achievements and superior accomplishments of a few of Texas A&M's outstanding alumni.

* * *

Dr. Paul Mossman, Medical Director 3300, was elected president of the Nuclear Industry Physicians' Association at a recent meeting of the group in Denver. NIPA is a section of the American Occupational Medical Association.

* * *

The 7th Annual Biennial CUBE (Computer Use by Engineers) Symposium is scheduled for October 15-17 at Lawrence Livermore National Laboratory. The purpose of the CUBE Symposium is to exchange information on computer hardware and software developments and applications among engineers at the Los Alamos, Lawrence Livermore, and Sandia national laboratories. Since the symposium is an informal exchange of information, written papers will not be required. Only the abstracts will be published, and these will be available at the symposium. To be considered, abstracts of 300 words or less must be submitted to your organizing committee member by June 20. Sandia's organizing committee members are Dave McCloskey (1520), 4-8870 and Bill Robinson (8240), 2-3124.

* * *

The 4th Symposium on Space Nuclear Power Systems, organized by UNM's Institute for Space Nuclear Power Studies, is scheduled for Jan. 12-16, 1987, in Albuquerque. The objective of the symposium is to provide a national forum for stimulating discussion, sharing information, and transferring technology among the planners, developers, and potential users of space-based power systems. Papers will be selected for presentation at the symposium based on a 1000-word summary. Deadline for summary submission is Aug. 15. For further information, contact Prof. Mohamed El-Genk, Institute for Space Nuclear Power Studies, Chemical and Engineering Dept., University of New Mexico, Albuquerque, NM 87131; 277-5442.

* * *

The New Mexico Network for Women in Science and Engineering is scheduled to meet at 6:30 p.m. on June 11 at the home of Ellen Cronin (6330). Hazlet Edmonds (3432) will speak on "FIRO-B: Testing Your Interpersonal Traits." You need not be a member to attend. Cost is $5 and includes dinner. If you plan to attend the meeting, call Ellen Cronin at 4-2475, Jennie Negin at 4-3202, or Marilyn Morgan at 6-5612.

* * *

The Rio Grande Chapter of the Project Management Institute will hold its June meeting on June 10 in Santa Fe at the La Fonda Hotel. There will be a social at 6 p.m., and the meeting starts at 6:30 p.m. Cost for the meeting is $13 pre-registration or $15 at the door. Bus transportation is available at $8/single, $10/couple. The bus will leave Albuquerque at 4:30 p.m. from the parking lot of Goodwill Industries on San Mateo. A workshop on stress management will be conducted on the bus by Erika Jones. Refreshments will be served during the trip to Santa Fe. Call Bonnie Haynes at 6-2067 for reservations.

* * *

Honor dad on Father's Day by taking him to the 4th Annual Reenactment of the 1862 Civil War Battle of Glorieta Pass on June 15. Don Alberts (former Sandian) will be the narrator and tour guide. The reenactment takes place at 11 a.m. on the site of the actual battlefield located on Pigeon's Ranch 17 miles from downtown Santa Fe. Guided tours of the battlefield can be taken afterward. To make donations to preserve the battlefield, contact Glorieta Battlefield Preservation, Inc., at 293-1028.

* * *

Lovelace Medical Foundation Clinical Studies Division is seeking volunteers for a high blood pressure drug research study. Volunteers, 18-70 years old, must already be diagnosed as having high blood pressure or have blood pressure in the range of 140/90 to 200/114, and cannot have any other serious medical problems. Participants will be paid $20 for each weekly clinic visit. There will be no charge for medical evaluation, physical exam, complete laboratory test, and EKG. Volunteers must be willing to stop taking present high blood pressure medication one week before beginning the research medication and will need their regular physician's permission to be in the study. Enrollment begins June 6. For more information, call 262-7560 (ext. 48) or 262-7538 and ask for the Clinical Research Coordinator.

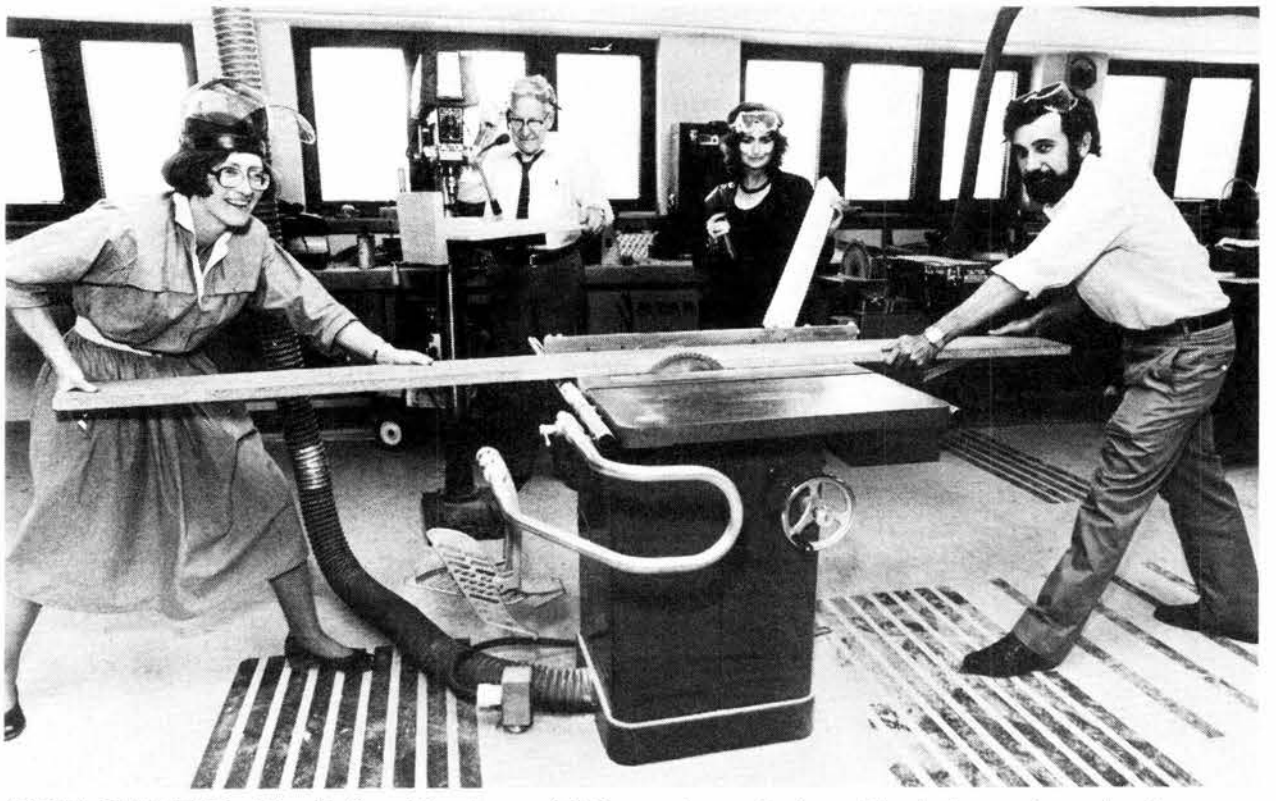
* * *

St. John's Graduate Institute is now accepting applications for its 12-week fall 1986 graduate session in Albuquerque and Santa Fe. "Politics and Society" will be offered in both cities, while a literature course will be available only in Santa Fe. The Master of Arts program meets two evenings a week and begins September 1. All classes are small discussion classes. Need-based financial aid is available. For more information, call 982-3691 (ext. 226) or write to the Graduate Institute, St. John's College, 1160 Camino de la Cruz Blanca, Santa Fe, NM 87501.

* * *

Fall openings for preschool and kindergarten are available at the East Preschool located on "D" Street across from the Kirtland parade grounds. Children must be 3 years of age by Sept. 1, 1986, to be eligible. Before- and after-school day care is also available. Call Joan Weninger or Jo Wernsman for more details at 4-8485.

Runners, Bikers, Rope Jumpers Celebrate Fitness Day 86



LOCAL CHAPTER of the National Academy of Sciences has volunteered to design and construct some hands-on exhibits and an inflatable planetarium for the new Museum of Natural History. Lots of opportunities for scientifically oriented thinkers-doers. The chapter is also looking for people for its "Visiting Scientist" program (to give talks and demonstrations all over the state) and for submissions to its *New Mexico Journal of Science*. For info on the latter, contact Barry Kues in the Department of Geology at UNM; for everything else, contact Janda Panitz (1834), the current president of NAS. Here, Mary Ann Sweeney (1265) and Guillermo Loubriel (1248) rip into a project at the museum as Bert Lindsay (2151) and Janda do the drilling.

TWO OF THREE GIFTED STUDENTS selected by APS and currently working as paid interns at Sandia are Mindy Keltner (1244) from Manzano H.S. and Mike Hager (1245) from Sandia H.S. Brendan Doherty (7537) from Eldorado H.S. didn't show up for the photo session at PBFA-I. All three seniors are going on to college. "This program gives them exposure to engineering so they can make a better decision as to what type of engineering they really want," says Soila Brewer (3533).

The Challenge of 'One-Shot Physics'

Underground weapon effects tests sound simple enough: Set off a nuclear device in one end of a tunnel and see what happens to the experiments—components, subsystems, delivery systems, etc.—in the other end. And, of course, don't release any radioactivity into the atmosphere.

Actually, it was never that simple even in the old days. And today the task of the field engineer is incredibly complex.

One major task is not only to contain the radioactivity within the cavity but also to prevent the other high-temperature and high-pressure effects from reaching the experiments.

Another is to ensure that the experiments are properly fielded; that is, to see that each separate item to be exposed in the test is going to see just the effect or combination of effects it's designed to withstand.

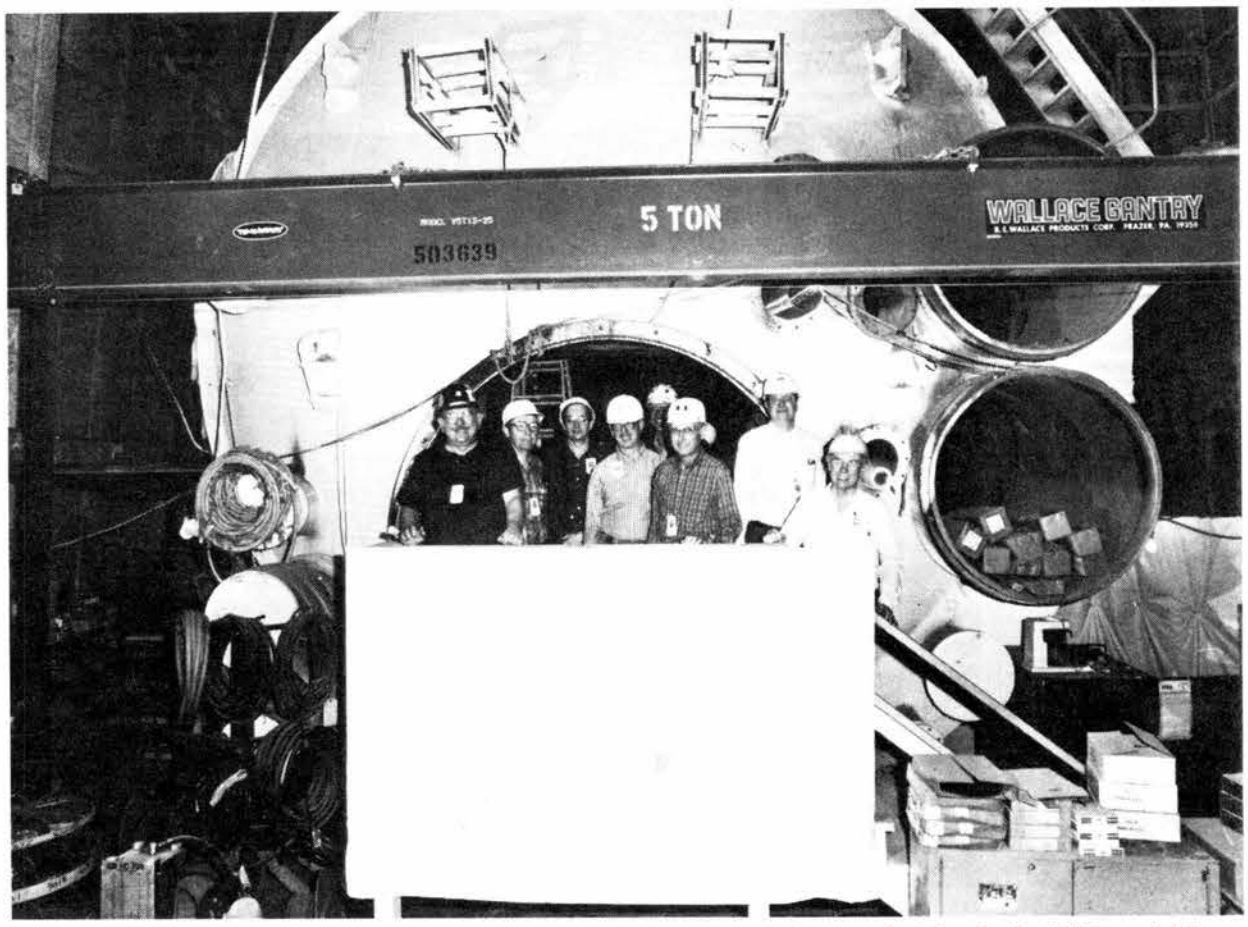
Another is to instrument many of the items so the responsible experimenter can determine just how a component worked during the detonation or just what caused its failure.

Still another is to provide "diagnostics"—measurements of all important outputs and effects created by the nuclear device during and immediately after its detonation so that experimenters can know precisely the nuclear environment their experiments saw.

And each of these tasks must be performed in a less-than-ideal laboratory—a giant, multi-forked tunnel running a mile or two into Rainier Mesa at Nevada Test Site.

The distance between, say, "T" or "N" Tunnel and the laboratories of Sandia proper is greater than the miles that separate them. And it's not merely the physical characteristics of a traditional lab in a manmade structure on the Albuquerque or Livermore end versus a lab carved from the living rock of NTS.

"Every test shot is different. It's what I call 'one-shot physics,' " says Jim Plimpton, manager of Field Sciences Department 7110. "In a traditional lab you can run something again and again, optimizing the conditions until you're sure of your results.



TOUR GROUP poses at the 20-foot-diameter experiment station end of a line-of-sight pipe in "T" Tunnel. (From l) Jerry Kennedy (7130), Milo Navratil (7120), Jim Plimpton (7110), Leon Keck (7123), Palmer Nelson (7124), Welber, Garry Ogle (7124), and Carter Broyles (7100). Photo by Chris Salinas, REECo

"Out at NTS, you don't get a second chance for a year or so. We're kind of an applied physics research lab that depends on exceptional engineering abilities to get to the bottom line."

He prefers NTS: "You never get stale out here."

Meet the Field Engineering Departments

Each of the tasks facing Field Engineering has its own technical challenges. For Jim's group, it means developing improved instrumentation, primar-

(Continued on Next Page)

Recent Test A Major Effort

From Sandia's point of view, at least, the most recent effects shot, which went off April 10, was the biggest such effort in several years. Its main purpose was to determine the radiation vulnerability of reentry vehicles.

In addition to the large systems, many subsystems, components, and advanced development materials and components were also exposed to the radiation from a nuclear device.

That all adds up to 28 effects experiments and 8 experiments fielded by Dept. 7110 to measure radiation outputs and study experiment protection. Twenty Sandia departments from both Albuquerque and Livermore participated, making a total of some 30 experimenters and 200 cassettes (separate experiment containers).

Field Instrumentation Department 7120 fielded 1350 channels linked to experiments in 19 square feet of exposure area in the line-of-sight pipe or in 40 square feet of areas exposed indirectly, that is, to scattered radiation effects. "This test utilized all of our instrumentation resources," says Leon Keck (7123), project engineer for the test.

"It was an intense three-year effort that demanded the cooperation of many people," says Bill Barrett (7116), technical director. "Initially, I worked with our experimenters to define what they needed on the test. Together, we translated those needs into the 'do-able' and negotiated with DNA to provide those facilities.

"Later, we had to set up the equipment to do all the data recording necessary, and to ensure that all the hardware was compatible with the test conditions," adds Bill. "Sure, we had lots of difficulties, but everyone worked together to get the job done. And we did get lots of useful results."

"Managing a project of this size would have been impossible without the cooperation of all the other people involved," says Leon. "Their experience and talent allowed them to do the job right with very little day-to-day input from me. Some of them put in a hundred hours a week underground before the shot. That takes dedication and enthusiasm for doing a good job.

"And we did do a good job — one to be proud of."

Creative Problem-Solving

Radiation Fog But Good Data

He's not even in Field Engineering, but he's something of a hero to the experimenters and field engineering people involved in one shot last year.

He's Clarence Robertson of Photometrics and Optical Development Division 7556, and he figured out a way to salvage some data that would otherwise have been lost, data not available from the other instrumentation used on the event.

Everything apparently went well during the actual shot—data traces from several of the instrumented experiments were received by the oscilloscopes in the ROSES drift paralleling the portion of the tunnel where the shot went off. And those data traces were recorded on photographic film in the cameras that looked at the oscilloscopes.

But an hour or so after the shot, a secondary explosion (probably hydrogen, oxygen, and/or methane) was touched off in the shot drift by a spark or a hot spot. And that explosion breached a closure designed to keep radiation out of the ROSES drift.

Radiation fogs film just as light does. And by the time it was safe to re-enter the ROSES drift, the film in the scopes had been exposed to high levels of radiation for a week. It looked as though the data from the scopes would be lost forever.

Clarence to the rescue. He knows film sensitivity, and he knows underground testing, and he's done the task before—it's not the first time film has been fogged by radiation.

What he did was to take the same kind of film, put it in the same type of scope, feed in the same sort of signal that the film probably recorded, and then use a Cobalt-60 source to recreate the radiation environment in the tunnel. Finally, he exposed the sample film to that source.

It took several tries, with each one varying the chemistry of the developer, the time, and the temperature. But he finally arrived at a point at which the image of the original scope trace was maximized and the fog created by the radiation was minimized. And at that point he, with the help of John Alexander, Buddy Hardy, and the other EG&G people in the NTS photo lab, processed the least-fogged data film in the same way. And it worked—usable data. (The rest of the film is in cold storage awaiting a possible breakthrough in development techniques.)

"It was a remarkable achievement," says Glenn Miller (7112), scientific advisor on the event. "Clarence was able to recover data that turned out to be better than any other radiation diagnostics information from the shot."

Continued from Page Seven

NTS: One-Shot Physics

ily more-sophisticated sensors to determine how a specific nuclear stimulus affects an experiment. It also means working with test planners from DNA (Defense Nuclear Agency, the organization in charge of defining, planning, and fielding nuclear effects shots). And it means working with Los Alamos or Lawrence Livermore (designers of the source device to be detonated) to determine what effects are likely from the device and from the environment in which it will be contained.

Most important, it means working with prospective experimenters long before a shot goes off to define both what the device's likely effects will be and which of those effects the experimenter's hardware must be exposed to. Answers to these questions determine where the experiment will be placed, how it will be shielded, and whether it will be instrumented.

Sometimes the experimenters already know enough to specify in detail how their experiments should be fielded, but often Jim's people must become intimately familiar with a given component so they can expose it in just the right way. And that can take some negotiating with an experimenter, especially when that experimenter hasn't yet gained much experience with underground test shots.

For Milo Navratil's group, Field Instrumentation Department 7120, the task is threefold: to do the mechanical engineering necessary to locate and mount the experiments; to provide technical direction, planning, and coordination of instrumentation design, fielding, and subsequent experiment recovery; and to gather data from the instrumented experiments.

"We're responsible for recording the response of hundreds of pieces of Sandia-designed hardware to the most hellish environment man can create," says Milo. "That means that one end of each of our data channels—and we can have more than 1000 channels on a big test [see "Recent Test" story]—has to survive the same conditions the experiment is seeing."

The other end may be a few feet away in a ROSES (Recording and Oscilloscope Sealed Environment System) alcove or in an instrument trailer parked at the portal, or mouth of the tunnel (typically a mile or more from the shot itself). The data are also transmitted via fiber optics to CP1 (Control Point 1), perhaps 25 miles away.

The technical challenges seem to become more formidable with each shot. "We rely basically on two digital recording systems—SANDUS [Sandia Digital Underground System] and DAASY [Data Acquisition and Analysis System] that we've developed and pretty well perfected over the years," says Palmer Nelson, supervisor of NTS Field Operations Division 7124. "The capabilities of the two systems overlap so that we can cover a frequency range from DC to about 10 megahertz."

"But now many experimenters want to look at data in the gigahertz range, and the only way we can meet that demand currently is with what some consider old technology, that is, oscilloscopes and cameras—144 of them on one recent test!" adds Ruth David, supervisor of NTS Instrumentation Development Division 7121. "Obviously, we need some new systems, with direct digital readout, developed for the sub-nanosecond regime, maybe something based on photonics . . .

"We're moving toward fiber optics instead of coax cable," Ruth continues. "We need to be pushing at the boundaries of what's technologically feasible in recording equipment. But at the same time, we have to have very, very high reliability in our equipment. Our customers, the experimenters, come to us because we can deliver the data. We can't jeopardize that relationship."

Test data must not only be delivered, they must be analyzed. And both Milo's and Jim's departments are home to experts in analysis. That's important—most experimenters don't have the detailed knowledge of the instrumentation systems required to explain an apparent anomaly, a chirp in a channel, a data dropout, a hiccup in a scope.

For the experiment protection people, such as those in Jerry Kennedy's Engineering Applications Department 7130, the challenges almost contradict each other. That is, they play key roles in, on the one hand, ensuring that no radioactive substances are released to the atmosphere. That would be simple enough—just dam up the tunnel so all the contamination is trapped there.

But, on the other hand, they have to permit selected effects to reach the experiments, but not, of course, the various recording devices stationed in ROSES alcoves alongside the tapered line-of-sight pipe that contains the device in the small end, the experiments in the large end. (The largest such pipe was 26 feet across—big enough to use half sections for carports—at the experiment station end.)

The experiment protection crews live in a world of split-second timing: Let the radiation pass down the pipe at the speed of light, but close that pipe before the shock wave arrives. And don't let any hot gases or debris hit an experiment.

"We routinely close off a 72-inch diameter pipe in 28 milliseconds," says Jerry. "Our Engineering Projects Division [7133] has developed and tested a new FAC [fast-acting closure] that gets us to our current goal—to close off a 30-inch diameter pipe in 1 millisecond." (See "Special Gates" story.)

That kind of capability becomes important as DNA moves toward tests that involve lower-yield devices so that close-in experiments see the same environment they would see on a conventional shot with a long (sometimes 1000 feet or more) line-of-sight pipe. Such an arrangement obviously is more cost effective—less mining to create the tunnel. The new concept and the new FAC were successfully tested last fall.

"Usually you can't just scale-up earlier closure devices to make them faster," notes Bob Statler, 7133 supervisor. "Our solutions — the FAC, for example — have to be more creative than that."

Milo's and Jim's people also play key roles in removing passive (non-instrumented) and active experiments after a shot when the reentry operation

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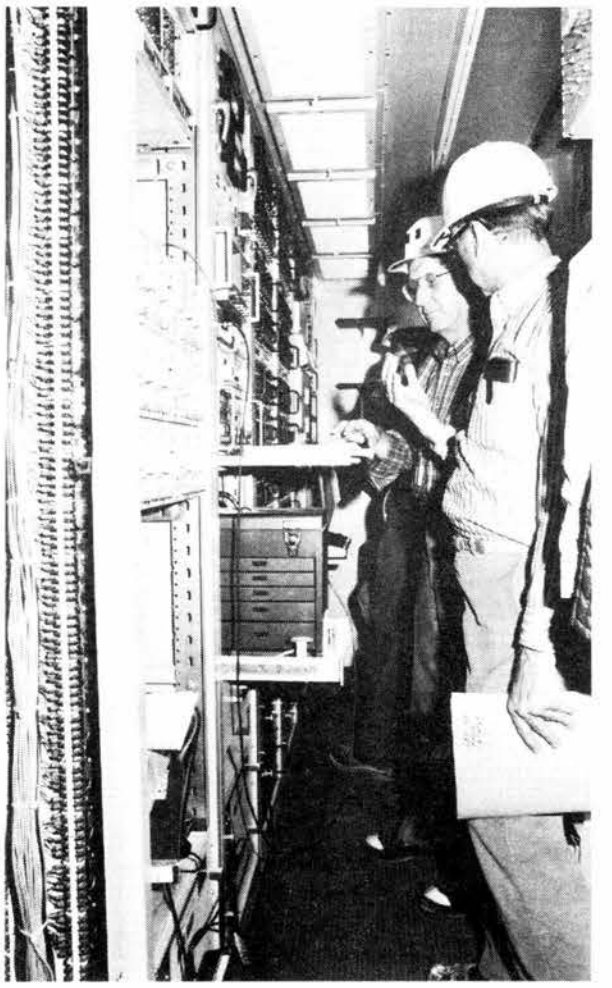
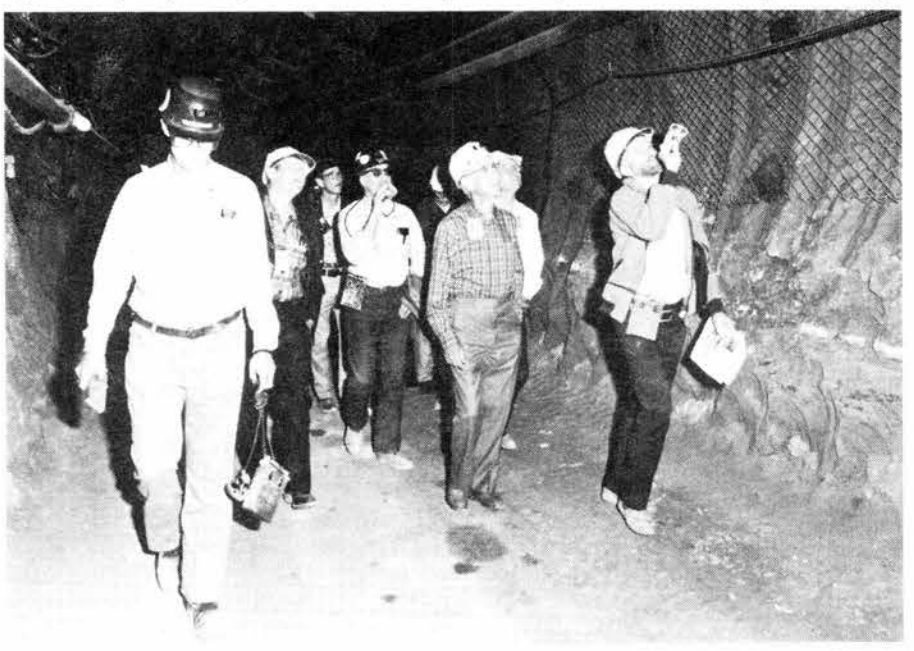
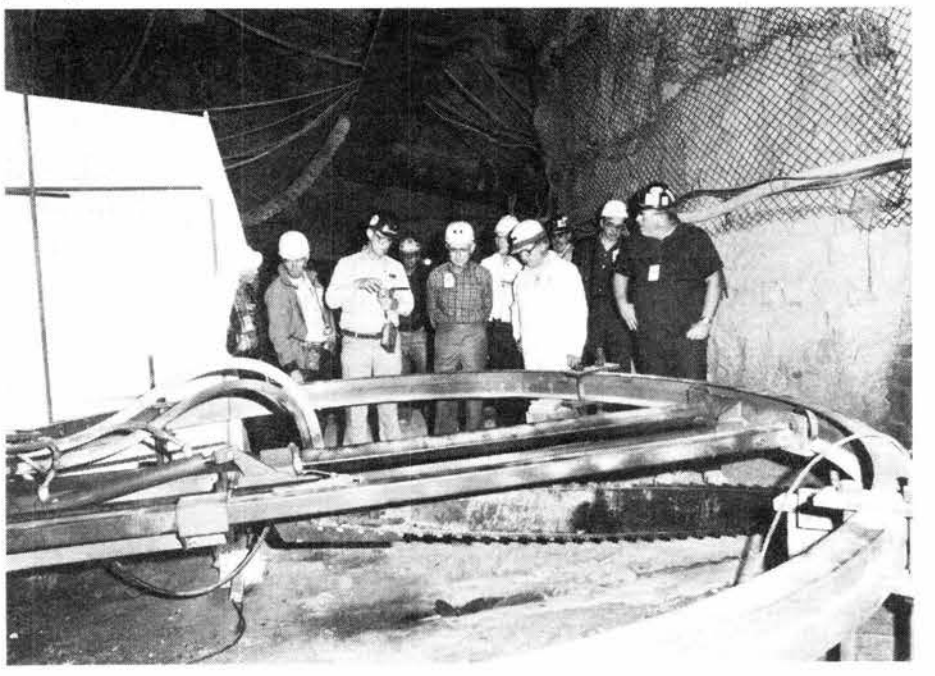


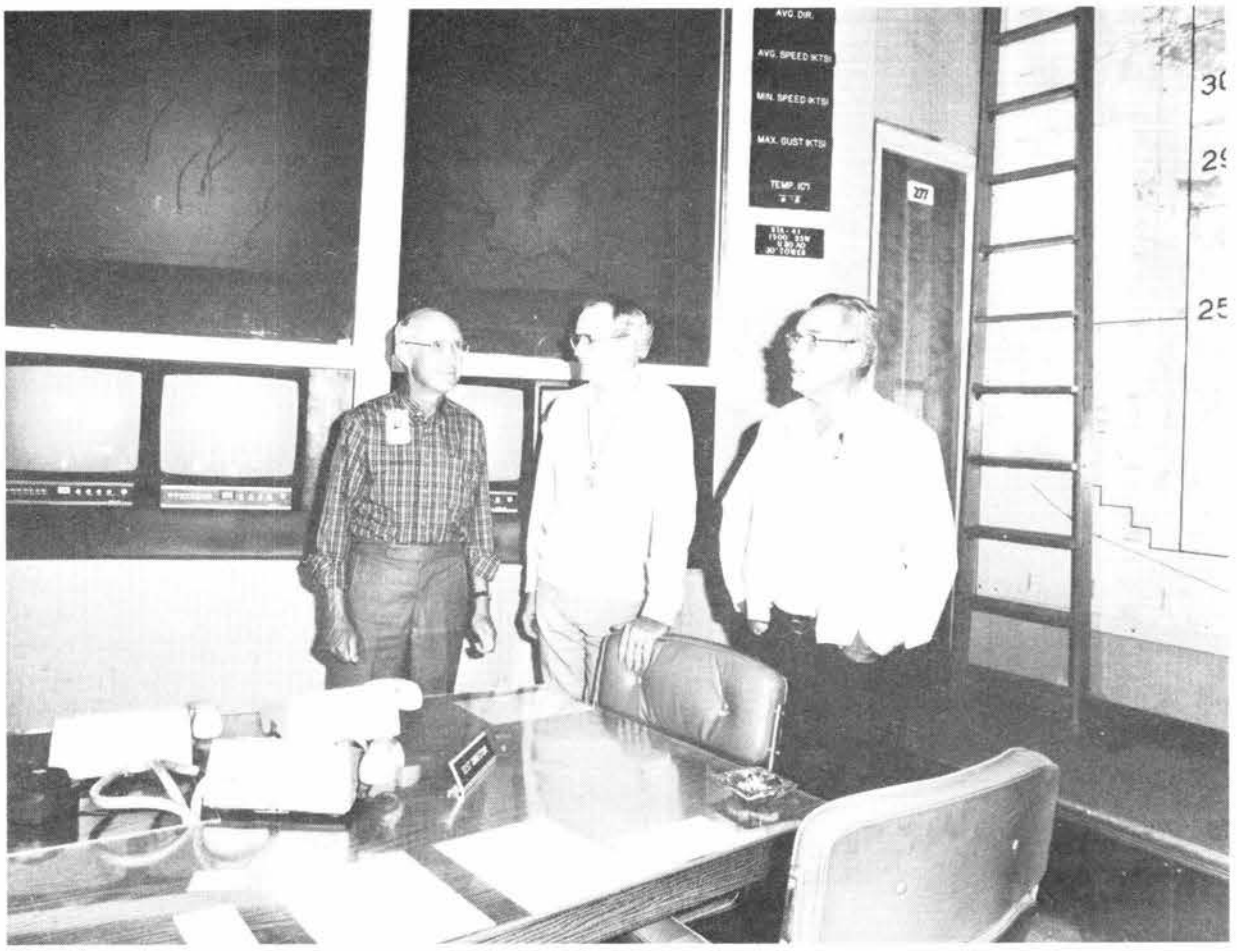
INSIDE ROSES (Recording and Oscilloscope Sealed Environment System) trailer, parked 1400 feet underground, Leon Keck (7123), project engineer for a recent test, explains a DAASY (Data Acquisition and Analysis System), which will gather data from active experiments during a shot. Photo by Chris Salinas, REECo



"G" TUNNEL houses several Sandia experiments, based in Geo Energy Technology Department 6250, that support DOE's Unconventional Gas Recovery (UGR) program, designed to develop techniques for efficient and economic recovery of natural gas from reservoirs with low permeability. Conventional fracturing techniques have proved disappointing, so the UGR program is looking at new ways to improve fracturing. Here, Dave Northrop (6253; right) points out a Sandia-generated fracture in the tunnel roof. Photo by Chris Salinas, REECo



GIANT CHAIN SAW in "G" Tunnel is one of several tools used by the Nevada Nuclear Waste Storage Investigations program based in Geotechnical Projects Division 6313. The program includes field experiments to document behavior of hard rock when subjected to thermal, mechanical, thermomechanical, and hydrothermal conditions by simulated nuclear waste containers. Photo by Chris Salinas, REECo



NTS's CONTROL POINT 1 (CP1) is some 25 miles from the tunnels where weapon effects shots are staged. This high-ceilinged room, ringed with CRT displays and maps, and full of phones, is the nerve center for an underground shot. Here Welber is briefed on its functions by Leo Brady (7131) and Carter Broyles (7100).
Photo by Chris Salinas, REECo

Continued from Page Eight

NTS

is completed and the experiment areas are again accessible.

Non-Technical Challenges Too

It takes a special kind of person to thrive in the NTS environment. For those people stationed there permanently, Las Vegas is home and going to work (NTS works a nominal four-day week) means a 65-mile commute just to get to Mercury. Mercury is the DOE company town situated at the entrance to the 1350-square-mile test site, an area 136 square miles bigger than Rhode Island. And, depending on where they're working within NTS, they may have another 40 or 50 miles to go once they reach Mercury.

For the field engineers based in Albuquerque or Livermore, Mercury becomes their home away from home for a week (sometimes, just before a shot, several weeks) at a time. True, Mercury has a bowling alley, a movie theater, a swimming pool, a ball park and running track, a 24-hour-a-day library, cafeterias, and a restaurant. Housing, these days, is every bit as comfortable and private as, say, Motel 6.

(That was not always the case. Milo recalls the first time he stayed at Mercury, in 1962: "We had four men per room and slept in double-decker wooden bunkbeds." And Carter Broyles, Director of Field Engineering 7100, remembers 1952: "We lived in

(Continued on Page Thirteen)

Sealing the 'Crack of Dawn'

Special Gates Protect UGT Experiments

You're standing 15 yards from a man. He is aiming a 30.06 rifle at your chest. Just in front of you is a MAC (modified auxiliary closure), open to its full 62-inch diameter. He fires the rifle. At exactly the same instant, the MAC is fired, cutting the high-pressure gas reservoirs. The expanding gases begin to push the two 12-inch-thick, 4000-pound MAC gates shut.

You're unharmed. The gates close before the bullet, traveling at 2700 feet per second (fps), reaches you.

Yes, the various closure systems developed by Engineering Projects Division 7133 for underground tests (UGT) at NTS work fast. They have to. Their task is to allow the radiation released by the detonation of a nuclear device to reach the experiments *but* keep the debris and, in some cases, the hot gases, from reaching, and ruining, those experiments.

In the example above, the MAC gates reach "obscuration" (the point at which the two horizontally opposed gates — like sliding barndoors but capable of overlapping — cross each other at the centerline) in 15.5 milliseconds (or thousandths of a second). It takes all of 27.3 ms for the gates to reach their final full-overlap position. Given about 125 ms as the speed of an eyeblink (some experts say it's as much as 250 ms, including reaction time), four MACs could close completely, one after another, in the time it takes to blink.

A larger version of the MAC has a 72-inch diameter opening. Its 5800-pound gates close in 42 ms.

Then there's GSAC (gas-seal auxiliary closure; MACs and GSACs are called "auxiliary" closures because they supplement the DNA-supplied closures that prevent radioactive substances from reaching the atmosphere). The GSACs protect not only against debris but also against hot gases. They close a 72-inch hole in 42 ms, and they also provide a seal that will withstand a 15,000-psi gas pressure.

Both MACs and GSACs serve as a debris barrier that resists penetration forces equal to 1-inch diameter steel balls impacting them at 15,000 feet per second (more than 10,000 mph).

Each of these auxiliary closures is basically a rectangular welded steel housing containing two massive aluminum alloy gates. The forgings needed for these gates are some of the largest produced in the U.S. An entire closure system — gates, housing, reservoirs, etc. — weighs some 90 tons.

MACs and GSACs are essentially gas-driven pistons. A reservoir containing nitrogen at 14,000 psi sits at the outside edge of each gate. At the firing signal, linear high-explosive charges sever the reservoirs, and the expanding gases slam the gates across the LOS (line-of-sight) pipe.

The gates' travel is slowed to a stop by crushing honeycomb blocks. Tapered steel mandrels carried in each gate, prevent rebound by engaging, and expanding inside of, steel latch sleeves attached to the housing.

"THIS FAC [fast-acting closure] shuts off a 30-inch hole in a thousandth of a second," Carter Broyles explains to Welber. FAC and other Sandia-developed closure systems play a key role in underground nuclear tests.

The newest closure, called FAC (for fast-acting closure), invites another comparison: This time, imagine a 30.06 rifle aimed at you from one end of the 30-inch-diameter cylinder that's the working area of a FAC. You're at the other end of the cylinder, only three feet away. Fire both FAC and rifle at the same time. The bullet wouldn't reach you—the FAC closes in 1 ms, and the bullet, traveling again about 2700 fps, could move only about 2.5 feet in that time.

So the FAC works even more quickly than its predecessors. It's used for the new shorter-LOS-pipe tests (see main NTS story), and it's positioned closer to the nuclear device. This means that the FAC has to work faster but doesn't have to close off as much area—a 30-inch diameter hole.

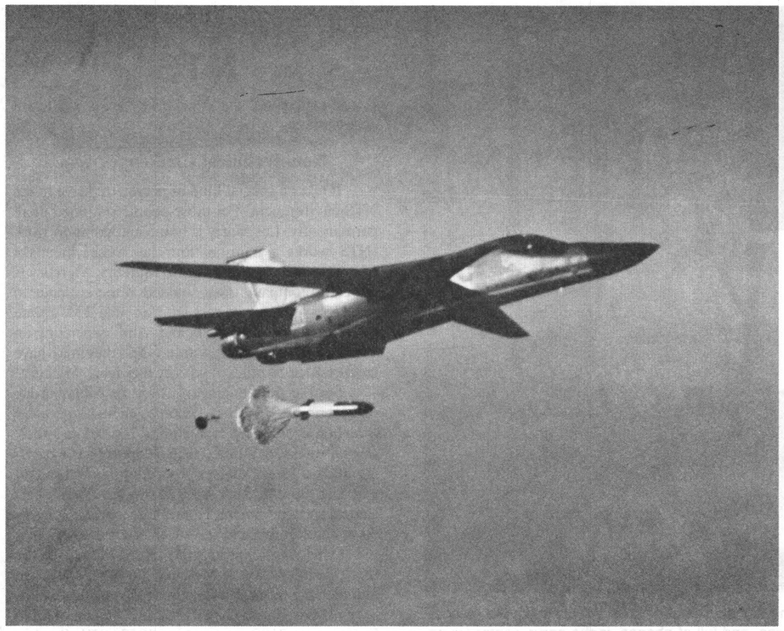
The principle behind FAC is somewhat different from that behind MAC and GSAC. FAC is essentially a thick aluminum cylinder that is squeezed shut by a chemical sheet explosive wrapped around the cylinder. The explosive acts much like a taut rubber band released around a soda straw.

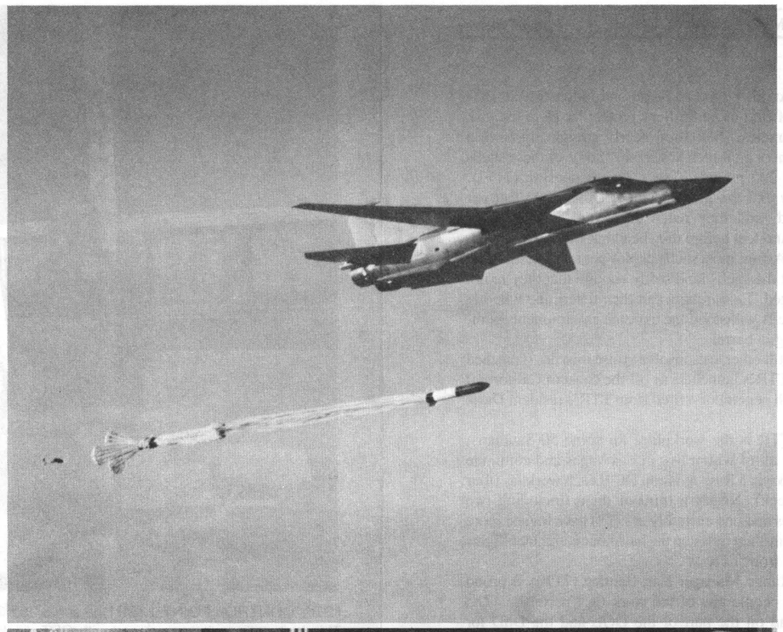
"These closures demonstrate creative engineering by a succession of outstanding designers," says Bob Statler, supervisor of Engineering Projects Division 7133. "That succession begins with people such as Bob Stinebaugh [6314] and Tom Hunter [6310], who designed and built the first auxiliary closure in 1971, and leads up to today's team of John Weydert and Dale Shenk [both 7133], who developed the GSAC and the improved versions of the MAC.

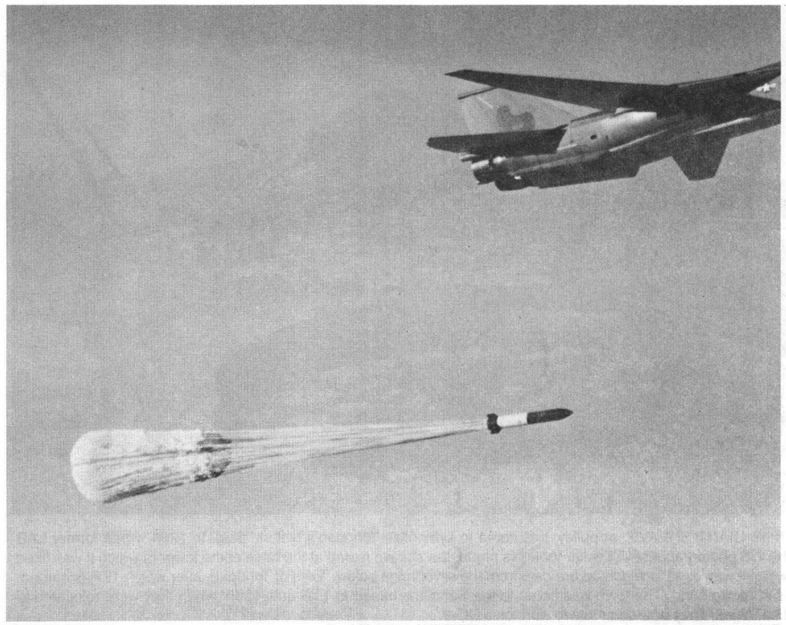
"Hal Walling [7133], Paul Cooper [7132], Les Hill, Bob Bass [both 7111], and George Staller [7133] developed the FAC," continues Bob. "Of course, we've all depended heavily on support from people in the design definition, materials and process sciences, and process development groups.

"We're still conceiving closures that are relatively stronger and larger — and that close even faster — than today's designs," concludes Bob.

"You might call it a 'fast-changing business'!"







TTR Delivers

Data from the Desert

If you're going to design weapons, you're going to need a place to check out their interface with their delivery systems. These will be, of course, just practice deliveries—nothing aboard that could cause a nuclear explosion. But the delivery systems include most of the aircraft in the DoD fleets, plus missiles and artillery.

Since 1957, Sandia's place has been the Tonopah Test Range—525 square miles of desert and dry (usually) lake beds tucked between the Kawich and Cactus mountain ranges 30 miles southeast of the small town of Tonopah.

TTR's product is data, provided quickly and in quantity, in the form of computer printouts or high-speed motion pictures or both. TTR's tools are tracking telescopes, telemetry ground stations, radars, and computers. Last updated in 1980, the facilities available at TTR are highly sophisticated. TTR's people are sophisticated at what they do too. Their talents lie in manipulating the tools to provide precision data on a wide variety of delivery events.

On a typical drop test, one or more of four powerful radars pick up the aircraft when it's perhaps a hundred miles from the target—long before it's visible to observers. The radars have both range and angle-to-target encoding equipment that generate digital data signals, which are transmitted, via microwave, to the Operations Control Center at TTR headquarters.

The signals direct the telemetry antennas and focus the giant tracking telescopes and mobile track-

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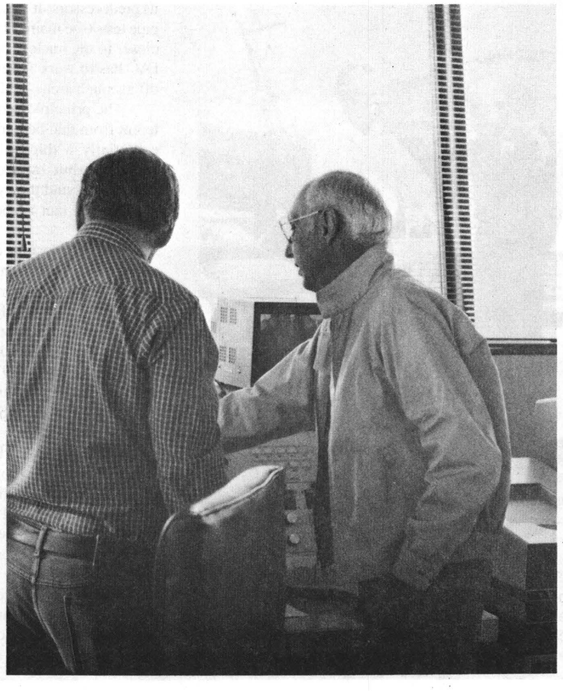
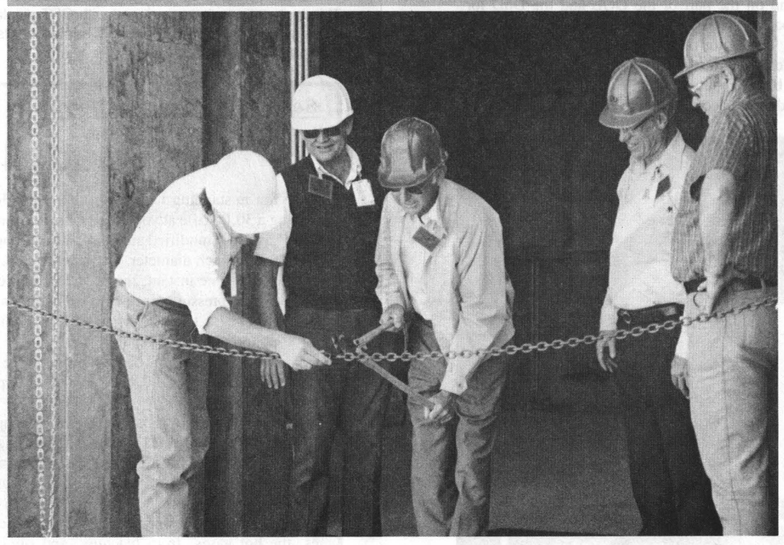
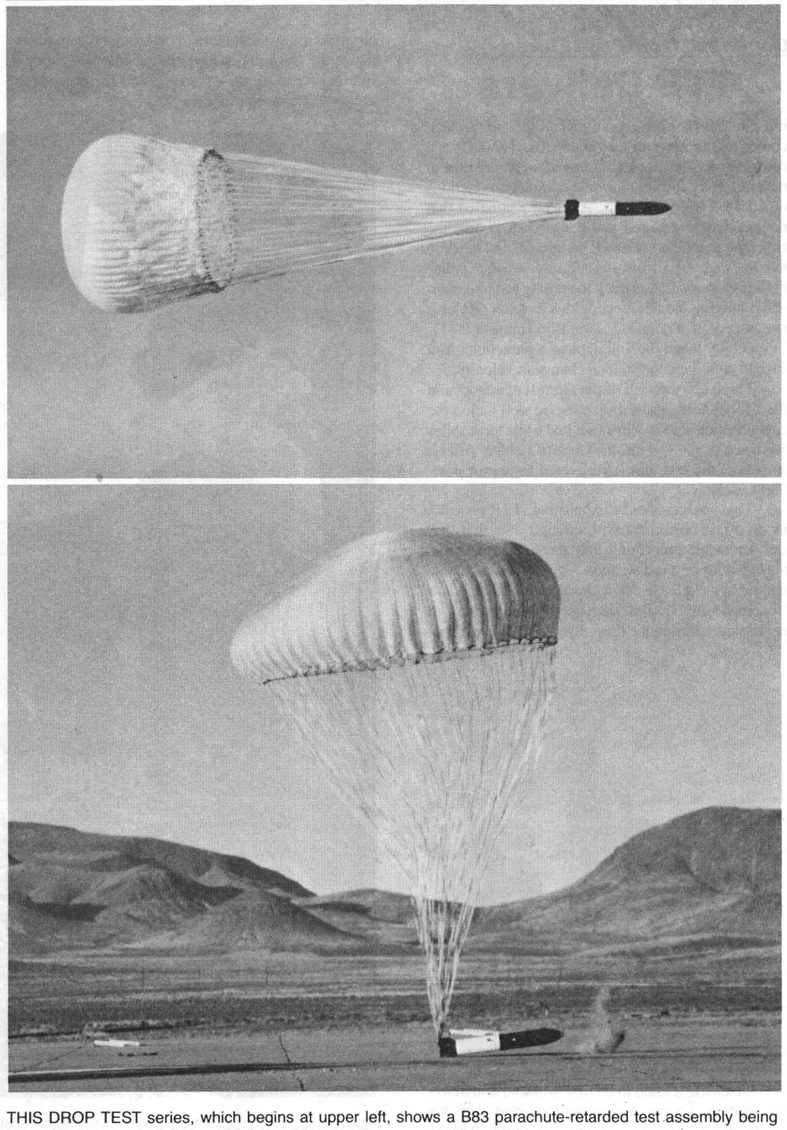


IN THE GLASSED-IN Control Room, TTR's nerve center overlooking the primary drop site, Welber discussed some of the facility's sophisticated data analysis equipment with Jim Enlow (7173). Dave Denton (7171) is at left. Photo by Pat Figelski, EG&G



"RIBBON CUTTING" at TTR's new Secure Storage Facility demanded a different kind of scissors. Andy Schirber (7173) assisted as (from left) Ron Bentley (7170), Carter Broyles (7100), and Bob Peurifoy (7000) cheered the chain cutting. Photo by Pat Figelski, EG&G

EIGHT-INCH GUN TUBE at TTR caught Welber's attention. Gun is used for tests of artillery shells. Photo by Pat Figelski, EG&G



THIS DROP TEST series, which begins at upper left, shows a B83 parachute-retarded test assembly being dropped on a hard target at TTR from an FB-111.

THIS GIANT SHEAVE, or pulley, has come to symbolize Tonopah's historic past. In 1964, when former LAB NEWS photographer Bill Laskar took this photo, the sheave rested at the base of the tower to which it was fixed when it was used to winch up ore cars from the silver mine below. Town of Tonopah, after which TTR is named, is in background. The town was home to the Sandians based at TTR until 1969, when they were relocated to Las Vegas. They now commute to work on a DC-9.

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TTR Delivers

ing cameras (or cinetheodolites) on the aircraft as it comes within range of the target area. The TTR test controller has been watching a radar-created plot of the aircraft's path and real-time computer reductions of selected telemetry data. After he's satisfied that range safety is ensured and the aircraft is over the target, he gives the "release" command, and the drop test package falls from the aircraft. At that point, the telescope operators track the falling test unit manually, guiding the telescope with a joystick. "That's not as easy as it sounds," says Ron Haines (7171), "especially when the unit deploys a parachute. You have to anticipate the sudden change in velocity."

Thanks to the skill of the aircraft operators and the TTR experts, most drop tests are well within the target area, generally a dry lake bed some three miles northeast of the Operations Control Center. After a drop test, the test unit is recovered to permit post-flight analysis.

That analysis can be exhaustive. TTR provides its drop test customers with enough data that they can determine everything they need to know about the behavior of a test weapon — its ballistic characteristics, its release from the aircraft (that is, its "compatibility"), and, perhaps most important, its performance during the drop. Specifically, the telemetry data allow customers to determine the environments the test weapon saw and whether a weapon's internal components — arming and fuzing system, etc. — functioned properly.

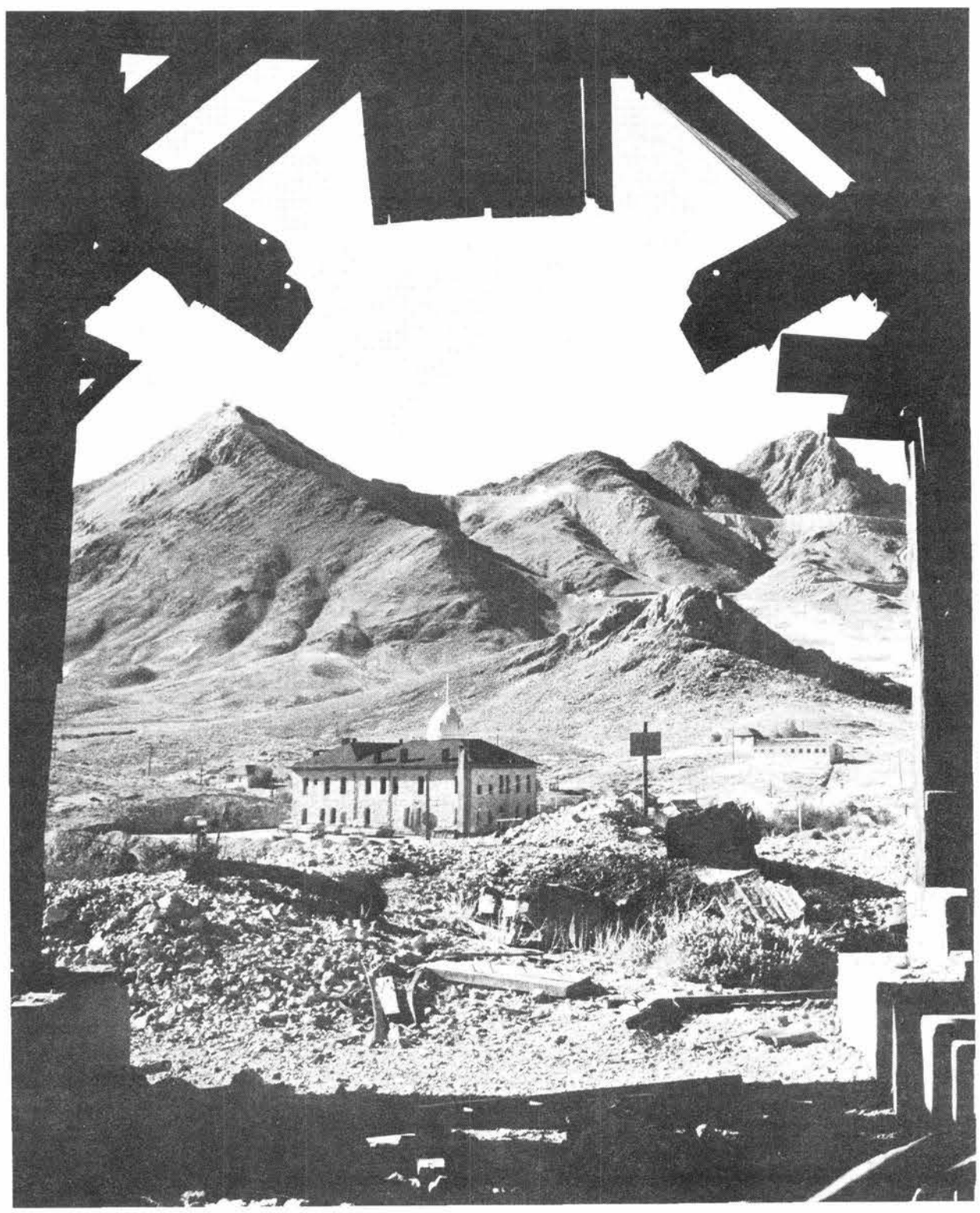
Another type of bread-and-butter test at TTR is the firing of an artillery projectile. Here the task is to track a shell fired nearly straight up from a 155mm or an 8-inch howitzer. "Some of these shells weigh 200 pounds," says Tex Samuelson (7173). "They exit the gun muzzle at some 3000 feet per second, and they reach an altitude of 60 or 70 thousand feet before they head back down to the target." Again, most shells deploy parachutes, this time so that the shells land softly enough that they're not damaged. Researchers can then determine whether the shells withstood the extreme environments within the gun barrel.

Still other tests involve cruise missiles (launched from TTR's launchers or off the coast of California) or earth penetrators (fired from TTR's resident Davis gun).

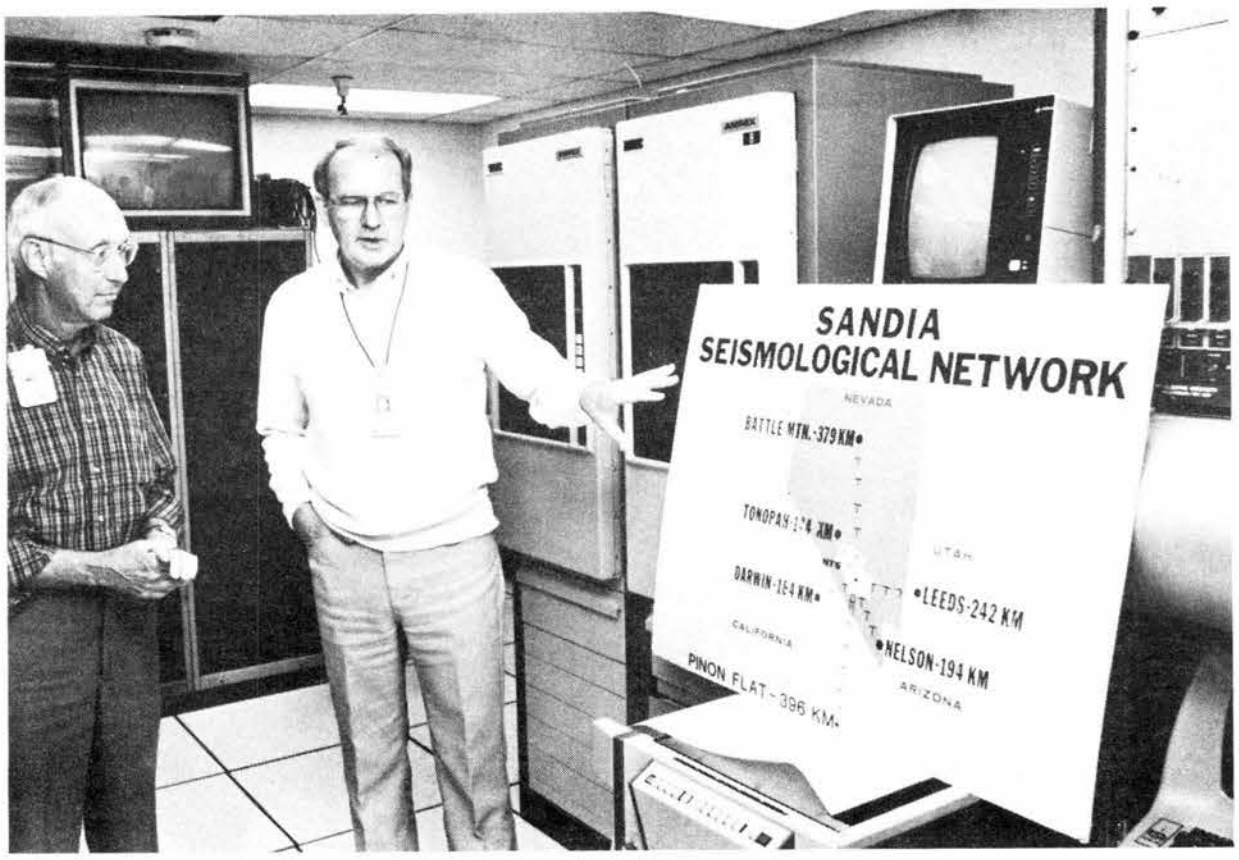
TTR is the workplace for some 50 Sandians, nearly all of whom live in Las Vegas and commute to work via a Ross Aviation DC-9 each workday (four per week). Nearly a third of them (including two retirees and one currently at NTS) have logged more than a million miles on the half-hour commuter flights to and from TTR.

Range Manager Ron Bentley (7170) is proud of his people and of the work they perform: "The demand on the part of the DOE and the DoD for Tonopah's services has increased steadily over the years. That's not only because it's one of the few drop test sites in the free world. It's also because we've built a reputation for delivering the data—and those data are accurate, complete, and timely."

TTR'S HORSES used to be rare and wild and therefore thrilling. Range is now overcrowded, and the horses are as exciting as those in a corral. Photo by Pat Figelski, EG&G.



ABANDONED ORE LOADING facility on the outskirts of Tonopah frames nearby Nye County courthouse. Spouts that once poured silver ore into carts are silhouetted at top of this 1964 Laskar photo.



SEISMIC SIGNALS from every test shot are recorded at half a dozen locations around NTS by the Sandia Seismological Network. Leo Brady (7131) shows Welber a map of the network in CP1. Photo by Chris Salinas, REECo

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NTS

tents, just like an army on maneuvers.'')

So the creature comfort level is good. And the work sites, a tunnel, for example, are at least tolerable. The people who stay in field engineering are those who enjoy solving a technical problem without the support systems available in Albuquerque or Livermore, who enjoy the independence of working with very little supervision, who enjoy being a part of a most important mission.

That's really what it takes to not only survive but prevail during long (often 10- or 12-hour, sometimes longer) days underground—a deeply held belief in the importance of the nuclear deterrent in preserving the nation's security and a corollary belief in the necessity for nuclear weapon testing to ensure that that deterrent is a credible one.

''Testing is vital,'' says Carter. ''Yes, simulation technologies have become highly sophisticated and continue to improve. But exposure to an actual nuclear detonation is still the only way we can test complete weapons subsystems and systems.''

Testing is vital. Yes, simulation technologies have become highly sophisticated and continue to improve. But exposure to an actual nuclear detonation is still the only way we can test complete weapons subsystems and systems.

—Carter Broyles (7100)

With ''actual nuclear detonations'' conducted these days only at Nevada Test Site, the work there is vitally important to the nation. It is, admittedly, difficult for some field engineers to concentrate on the positives and disregard the negatives. One of the latter is the long hours away from family. Las Vegas-based Sandians leave home at 5:30 a.m. and return 12 or 13 hours later. Some Albuquerque-based Sandians spend more weeks than they'd like catching the Ross charter on Monday mornings and returning home Friday nights.

But there are rewards: ''There's technical chal-

(Continued on Page Fourteen)

Walt Remembers . . .

The First A-Bomb Misfire

Able was the sixth shot at Nevada Test Site (then, commonly, Stateside Proving Grounds) and the first in the Buster series. A tower shot set for Oct. 19, 1951, on Yucca Flat, it was to be followed by two airdrops, Baker on Oct. 28 and Charlie on Oct. 30.

In the darkness an hour before shot time, the members of the arming party locked open all the electrical switches in the control room, in the switch stations between the control room and 100-foot tower holding the nuclear device, and at the tower itself, located some 10 miles from Control Point 1 (CP1). They then climbed to the cab at the top of the tower and connected the cable between the tower power supply and the device itself.

The men climbed back down the tower and retraced their earlier route back to CP1, this time locking all switches in the ''On'' position. The device was now ready to be armed and fired.

The party then joined the observers (VIPs, scientists, and others) on ''News Knob'' across the road from CP1, and began counting the minutes until H-hour and detonation.

At H-10 seconds the automatic sequence timer started the final countdown. ''Each second thereafter was an eternity,'' Walt Treibel (ret.) remembers. ''Then 'zero.' And shocking silence.''

The PA system finally came to life: ''Misfire. There has been a misfire.'' As the *Saturday Evening Post* tells it, ''It was Al Graves' [AEC] darkest moment—his first and only fizzle as United States' atomic-weapon test chief.'' The *Post* goes on to report these thoughts in Graves' mind: ''Is the device alive? If not, why not? Has a relay stuck which might give way any second?''

Not only for Graves was it a dark moment; he called to his office several men who knew the device and its arming and firing requirements. The group reviewed previously prepared emergency procedures, but the next step was inescapable: The device must be disarmed.

''I'd been a member of the arming party, and I guess I felt a responsibility for being part of the *dis*arming group,'' says Walt. ''I remember thinking, 'Okay, let's get it over with.' '' So he, Asst. Scientific Director John Clark of Los Alamos, Barney O'Keefe of EG&G—who later became president of that organization—and Joe Dawson of Sandia (who left the Labs in '51) headed for the tower.

''As we walked to our car, I recall that we nodded to our friends,'' says Walt. ''At that point, we weren't sure we'd be seeing them again.''

The party sped toward the tower, which by now was clearly visible. ''We kept the sun visors down so that we wouldn't be blinded temporarily if the device detonated,'' recalls Walt.

WALT TREIBEL (ret.) shows off a connector similar to the one that caused the first A-bomb misfire in 1951.

They stopped first at the switching station two miles from the tower to disconnect the electrical circuits that had been connected only a couple of hours earlier. At a quarter of a mile from the tower, they realized they could raise the sun visors—temporary blindness would be the least of their worries if anything went wrong now.

Finally, they pulled up at the base of the tower. ''One by one, we started up the ladder,'' says Walt. ''We had to stop often to catch our breaths, and the climb wasn't made any easier by the realization that we still had no idea what had caused the misfire. I think we all knew that each step up could be our last. If the tower hadn't been vaporized by the blast three days later, I'm sure you could still find my fingerprints embedded in each steel rung of that ladder.''

When they reached the cab containing the device at the top of the tower, they disconnected the cable between the power supply and the device. The disarming of the device was complete.

''Once that was done, we could finally relax,'' Walt continues. ''And we realized we were completely exhausted—after all, we'd been awake for some 26 hours. But we still had to go back and report our success to Al Graves.''

The cause of the misfire? In spite of a keyway, designed to prevent a symmetrical connector insert from rotating in its mating connector, one insert had shrunk and rotated 90 degrees. The result was that no electrical power reached the device.

The Able shot went off successfully on Oct. 22. It was followed, as scheduled, by Baker and Charlie. ''We learned some lessons from Able,'' Walt notes. ''We increased the instrumentation to provide more diagnostic information back at CP1, we incorporated some additional safety features in our designs, we started a program to mold connector inserts into the connector shells so the inserts couldn't rotate, and we certainly discouraged the use of symmetrical connectors.''

AERIAL VIEW of Mercury, home away from home for Albuquerque and Livermore Sandians on temporary NTS assignments. It's also staging area, supply depot, and recreational site for the Site. "Mercury's come a long way since the four-man tents of the 50s," says Carter Broyles (7100).

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lenge and there are mental rewards," says Milo. "And there's certainly a camaraderie among field engineers. But, beyond that, there's an excitement, a sense of adventure that reminds me of the Old West, permeating field engineering."

Dave Jackson spent several years as public information officer at the Nevada Operations Office in Las Vegas. He's now DOE/AL's PIO, but he remains a staunch admirer of the NTS task and talent: "The test site is probably one of the most exciting places in the whole world. Each test is unique—unique parameters, unique purpose. And no one takes a shot for granted. So you get a dynamic feeling. During the final hours before a test, you feel excitement, tension everywhere.

"It's a certain fraternity of people who do test shots," Dave continues. "It's a diverse group, but if you're in testing you know you're in something special, and you feel it. The words that come to mind for me are 'camaraderie, *esprit de corps*.' And don't forget that NTS has a fantastic record of safety, performance, accomplishment."

"We stay with it because it's a challenge," says Jim, "and because it affords a sense of accomplishment and discovery, real opportunity for job satisfaction."

STARTLED BY THE PHOTOGRAPHER, Ray Peabody (7132) is caught in his work location, deep in a tunnel in a bypass drift next to a shot site. He's working on the arming and firing system for the MAC and GSAC gate closure systems (see Closures story). A part of Field Engineering since 1968, Ray typifies the breed: "I enjoy the work," he says. "Each shot poses different challenges, so the job never gets to be routine." Photo by Chris Salinas, REECo

'Absolutely Unshakable Calm'

The Disarming Of Diablo

NTS. June 28, 1957. A nuclear device sits atop a 500-foot tower overlooking Yucca Flat. The Diablo test is on.

The countdown ends—3, 2, 1, Fire.

Nothing. Absolutely nothing.

Sandia's arming and firing expert, Bob Burton (ret.), along with three engineers from (then) the University of California Radiation Lab (now LLNL) and one from EG&G, drives back out to the site from Control Point 1. Their job had been to arm the device; now it's to find out why the device hasn't fired. After all, the dry runs had proven that the device was ready, that all it needed was the proper electrical impulse.

Had the power somehow not reached the device? Or was it a dud? Or was it live and armed—likely to detonate if probed and palpitated? At this point, there was no way to know. But they did know that the first task was to disarm it.

There was only one way to do that—climb the ladders, enter the "cab" (the working area at the top of the tower), and pull the cables. Straight up Bob and two of the UCRL engineers climbed, for 35 laborious minutes.

"By the time we got to the top, I was wondering why we couldn't use shorter towers," Bob recalls. He doesn't recall any fear, and he probably felt none—later that year LIFE magazine called him "a man who gives the impression of absolutely unshakable calm."

While the UCRL men removed other system connections, Bob loosened the locking rings on the patch cables and slowly pulled the cables out. When he was finished, he simply said, "Okay." LIFE was probably right in its assessment of his character.

Determining the cause of the electrical failure was easy — later. Somehow, the power to the tower cab had been connected to the power running the hoist, or elevator, that had provided access to the cab. The hoist winch had been moved away from the tower just before the countdown began—no sense in vaporizing a perfectly good winch—and that removal had disconnected the power needed to make the device detonate.

"We made the necessary repairs, and Diablo went off successfully a couple of weeks later," says Bob. "And after that we ran FPFF [full-power, full-frequency] tests to keep the problem from happening again."

40-FT TRANSFORMER DAISY for Kirtland's child-care center? No, this is fusion art: A crane moved the innards of PBFA I into place at Tech Area IV where they are braving the natural elements — and becoming a new landmark for pilots taking off the runway.

AS WRENCHING EXPERIENCES go, this one may have topped it for Bob Clevenger (1254), who put up the high-tech "sculpture" in time for official dedication on April 4. The rest of PBFA I is being transformed into the Saturn facility.

volunteers in action

Here are a couple of current volunteer opportunities for employees, retirees, and family members. If you would like more information, call Karen Shane (4-3268).

ALL FAITHS RECEIVING HOME provides short-term residential care for non-delinquent children. Every autumn All Faiths holds its annual Apple Festival to raise funds for the home. It is seeking volunteers to make crafts for sale at the event. Supplies will be provided.

RIO GRANDE NATURE CENTER, an environmental education agency in the North Valley, is planning a hands-on resource room for children. Volunteers are needed in all phases of the project—planning, photography, calligraphy, research, carpentry, and minor electrical wiring.

Fun & Games

Tennis — Sandia Tennis Association Memorial Day Tennis Tournament results: The winner in Men's A Singles was Mike Walter; the runner-up was Mark Kargel (5142). In Men's B Singles the winner was Mark Lobitz; runner-up was David Smallwood (7544). Men's Doubles winners were Mark Tucker (7544) and Jeff Tsao (1141); runners-up were Larry Schneider (1251) and Tim Mooney (5141). Men's Doubles Consolation Winners were Gabe Juric and Mark Lobitz. The Women's Singles winner was Charlene Schaldach (2645); runner-up was Brandi Concannon. Women's Doubles winners were Sara Cericola and Cathy Schirber; runners-up were Terry Martinez (1250) and Charlene Schaldach (2645). In Mixed Doubles the winners were Brandi Concannon and Tim Mooney (5141). The runners-up were Terry Martinez (1250) and Mark Tucker (7544).

* * *

Golf — The results of the latest two Sandia Golf Association tournaments are in. On April 28, more than a hundred hearty linksters showed for the Ladera Open tournament; most of them finished. The low net scorers for each of the flights, 1-5 respectively, were Charlie Carter, Daryle Dew (1233), Jose Llamas (7556), Floyd Salas, and Ken Ward (1823).

At the Capitol Punishment Tourney in Santa Fe on May 2 the winners were Dick Fairbanks (3428), Tony Lopez (3154), Frank Gallegos (3523), and Tom Welch (342). Runners-up were Mike Quinlan (7833), Lenor Morrison (341), Ed Salazar (1652), and Bob Helgesen (7842).

* * *

More Golf — Ninety-two golfers played in the Southern Classic Golf Tournament in Socorro on May 24. The tournament format was 2-man best ball. The top three teams in each flight and their net scores are: A Flight: first place, Bob Wood (3726) and Bill Lutgen (2853) - 62; second place, Wendell Nelson (143) and Ed Thuman (2822) - 63; third place, Parris Holmes (7555) and Helen Gallegos (5255) - 65. B Flight: first place, Dennis (7535) and Joey Gutierrez - 63; second place, Joe Apodaca (3428) and Steve Valdez (3428) - 66; third place, Phil Fajard (2313) and Ed Bernal (ret.) - 67. C Flight: first place, B. Black and Joe Fernandez (6221) - 57; second place, Gene Marquez (7400) and Charles Duvall (2853) - 62; third place, Larry Wilhelm (2631) and Pro Padilla (3743) - 62.

Mark Calvin (3532) qualified for the Regional finals of the National Long Drive Championships with a drive of 327 yards on May 28 at Arroyo del Oso Golf Course.

* * *

Running — The Love Run Invitational, benefiting the Muscular Dystrophy Association, is set for June 14, starting at 6:30 a.m. from the old Mt. View Inn (formerly Western Skies) on Central Ave. and Tramway S.E. The course heads east along Old Highway 66 and north to Cedar Crest, and is measured for a 20-mile run (10 over, 10 back); but runners can complete anywhere from 2 miles to 20 miles. This is an informal run with no split times or prizes for participants. Donations or pledges should be secured from sponsors for each mile finished. For more information, call MDA at 294-8881.

* * *

Camping — Youth dependents of Labs and DOE employees are eligible for the KAFB Youth Center Day Camp for children ages 6-12. Cost for the program is $40/week with breakfast and $35/week without. Families with two children will need to pay for each; a third child will not have to pay. For more information, call the Youth Center at 4-9975.

feedback

Q. The response to a Feedback item in the LAB NEWS some months back missed the point — mostly. Planting and landscaping are nice, but it doesn't clean up the junk and trash. I just walked from MO-162 to Bldg. 800 and saw:

1. Enclosure panels off the side of MO-164 and MO-165 leaning against building (been there for several weeks).

2. Two homemade ladders near MO-164 (been there since buildings were occupied).

3. Junk mail carts north of Bldg. 824 (accumulating since ?).

4. Cardboard boxes trapped against the fence.

Let's get serious — landscaping 960 isn't the answer!

A. Your concerns for cleanup of ''trash and junk'' are admirable. If all employees shared your enthusiasm, the problem would surely be less evident. We are taking some positive steps to improve the problem. The items listed on your complaint have been brought to the attention of the responsible division and departments. Plans for improvement in our trash collection and cleanup procedure have been in progress for several months. The implementation of those plans will be evident in the future. Some of these plans are as follows:

1. The pickup of the dumpster trash collection system will be computerized and improved for more effective operation.

2. Employee bulletins will be issued to inform employees about proper disposal of trash and junk items.

3. Collection of paper products for Sandia's recycling program is not cost-effective and has been stopped. This was one major source of paper nestled in fence corners.

4. We continue to review contractors' trash accumulation and disposal.

5. Departments 3420, 7810, and 7830 are reviewing their responsibilities in these areas and are initiating positive programs to improve the overall appearance and condition of the area.

R. W. Hunnicutt - 7800

Q. Was the Animal Humane Association a valid donor option choice for last fall's ECP campaign? My organization representative said it was, but Div. 152 employees refused my check because AHA is not ''people-oriented.''

A. In 1982 the ECP Committee adopted United Way's Donor Option Plan to allow employees to support specified United Way Agencies or other nonprofit, tax-exempt, human services organizations of their choice.

Subsequently, the ECP Executive Committee agreed that all funds, undesignated or designated, would be remitted to United Way for processing and distribution. The United Way will distribute designated individual gifts to tax-exempt, United Way and non-United Way human services agencies in New Mexico as requested by the employee. If the agency designated does not meet the Donor Option Plan criteria, the employee will be notified by the United Way Donor Option Plan Committee so that an alternative may be selected.

We contacted United Way officials who verified to us that AHA does qualify under their guidelines. In fact, a gift to this organization was processed as a result of the 1985 campaign. In your particular case, however, your check was not made out to Sandia-ECP; it was made out directly to the agency. In that case, Sandia cannot process the check and we have no choice but to return the gift to the donor.

Under present United Way guidelines, you should not encounter any future problems in contributing to AHA provided your check is made out to Sandia-ECP and accompanied by a completed Donor Option card.

B. W. Marshall - 6250
1986 ECP Chairman

Q. Why can't Sandia initiate some cost-saving measures such as issuing only one phone directory change per month? The cost savings for printing and distribution would be substantial, but a small savings compared with the constant filing required by 8000 employees.

A. The line organizations request the changes, and it is important that they be issued within a reasonable period of time. One of the major problems with making changes to the Telephone Directory has been the accuracy of the information by the time change pages are issued. Recent studies, based on issuing two sets of organizations changes a month, show that it takes an average of 8-9 weeks from the time an organizational change is made until the Telephone Directory reflects the change. This time lapse would increase with less frequent printings of organizational changes.

We feel your suggestion has merit, however, and we are willing to give it a try. This will not include the quarterly Livermore changes or the periodic changes made to the Personnel Directory.

A. J. Davie - 3000

Q. Does the Credit Union still purchase UNM football and basketball season tickets? In years past, Credit Union members' names were drawn for each game and that member was given the tickets free of charge. This year the season tickets for basketball were used exclusively by a couple of Credit Union employees. Does the Credit Union still buy these tickets, or have they been sold to those employees?

A. Several years ago the Credit Union discontinued the purchase of athletic tickets. The seats were subsequently purchased by Credit Union employees.

Joe Ruggles, President
SLFCU Board of Directors

Q. What can be done to improve the service from the film bank in Bldg. 836? Drawings are essential to my work, but I have never been able to get prints from the film bank in less than two hours, even though the operators are reading or holding personal conversations when I put in the request. Often it is four hours or more before I get my prints.

Today I went to the film bank twice over a period of more than an hour to try to put in a request, and both times the film bank was closed and locked. There was a sign saying ''Temporarily Closed'' but no indication of when it would reopen. Apparently this is a common occurrence, but I find it absolutely unacceptable.

A. The volume of prints requested from the Film Bank in Bldg. 836 has been significantly reduced by the relocation of approximately half of its former customers to other buildings. Current volume and staffing levels can justify only one operator in Bldg. 836 so the film bank is closed occasionally for brief periods. In the future, the time of re-opening will be posted. It should be noted that when the 836 Film Bank is closed, print requests can be placed by putting the request in the tray located adjacent to the film bank or by placing a request in person or by telephone at the Film Banks in Bldgs. 802 or 892.

The drawing print service level is designed to meet the average requirements of the Labs. Print requests are normally filled on a first-in, first-out basis. With a volume in excess of 60,000 prints each month, some queueing is unavoidable. Requests for four to five prints are usually filled in ten minutes to two hours depending upon the queue. For more urgent needs, the requester may ask the film bank operator for priority service and have the request filled before others in the queue. If other priority requests are not in process, prints can be available in a matter of minutes.

To provide a more timely response, it would be appreciated if future inquiries about 2800 service would also be directed to the responsible division supervisor.

H. W. Schmitt - 2800

Q. For making coffee, I frequently use water from the janitor's closet across from the vending machines in Bldg. 892. At times the water has a greenish tint or sometimes an effervescence (a gray, murky look that clears). Is this water safe to drink?

A. We recommend against the use of janitor's sinks for drawing drinking water because of the possibility of contamination from the nearby cleaning equipment and supplies, and the generally unsanitary conditions associated with such sinks. You may be interested in the coffee sink in Rm. 2000 in your building. This sink was installed to address a problem similar to yours. You and your supervision can request such an installation from Plant Engineering directly; 3300 approval is not needed.

The gray, murky look you describe probably comes from dissolved gases in the water and does not indicate a hazard. The greenish tint you describe, however, indicates a possible problem with undesirable plumbing cross-connections. If this colored water is seen again, call Division 3311 to have a sample of the water collected and analyzed.

P. B. Mossman - 3300

Q. Why can't something be done about making Gibson on Base safer for bicyclists? Other streets on Base have bike routes alongside or signs reminding drivers to watch for joggers. I ride my bike to work every day, and it is getting increasingly dangerous on Gibson between Louisiana and Pennsylvania. Drivers are exceeding the speed limit by a considerable amount, but there is never any activity in the area by Base Police. In addition, the corner at Pennsylvania and Gibson is quite dangerous due to the large number of cars turning south onto Pennsylvania, sometimes cutting me off just a few feet before the turn. Perhaps one solution (although not the best) might be to post signs along Gibson similar to the ''watch for joggers'' signs to ask motorists to be more considerate toward bicyclists, since we have as much right to use the roads as they do and are considerably more vulnerable, no matter how safely we ride or dress.

A. The traffic concerns you stated can be resolved only by the Air Force Security Police, since they have jurisdiction on Base streets. KAFB's Civil Engineering Squadron has a ''Bike Path Master Plan'' that locates all existing and proposed bike paths on Base. The Master Plan does not show any plans for a bike path along Gibson. However, a Boulevard Master Plan study of October 1985 proposes a bike lane on both sides of Gibson Boulevard from the gate to Pennsylvania Boulevard. Since the bike lanes are only recommended in this study, there is no assurance that KAFB will concur or fund the additions of the bike lanes.

The Air Force has issued a work order to reconstruct the bike path that was destroyed during the construction of the drainage detention basin near Wherry School. This bike path begins at the Gibson gate, proceeds south of Wherry School, through Zia Park housing, and ends at H Street and Pennsylvania Boulevard.

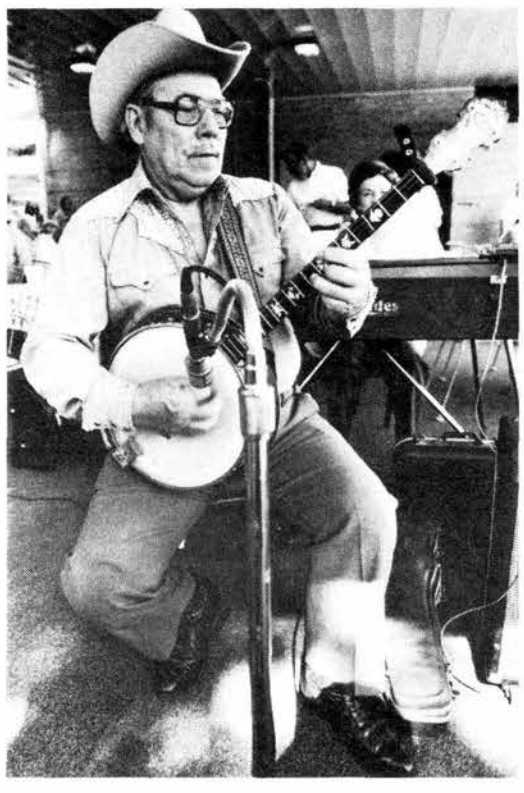
R. W. Hunnicutt - 7800

Q. Why can't we have direct-distance dialing for long-distance credit card calls at the Labs? Every time I call home (out of state), the operator must take my credit card information. This results in a much higher cost for the call.

A. The KAFB No. 1A ESS is not equipped to transfer dialed credit card billing information to the Mountain Bell credit card billing equipment. Therefore, it is necessary to process credit card calls through an operator. There are no plans to install this equipment because of its cost. The Air Force plans to upgrade its switching technology, but the timing is a little indefinite at present. We do not expect any relief for this problem in the near future.

R. J. Detry - 2600

1666 Attend Retiree Picnic 86



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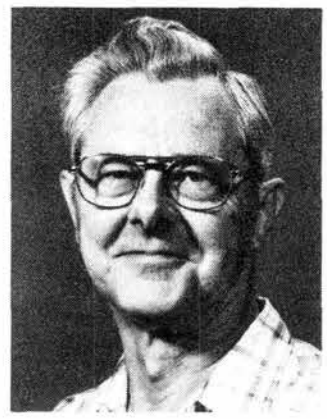

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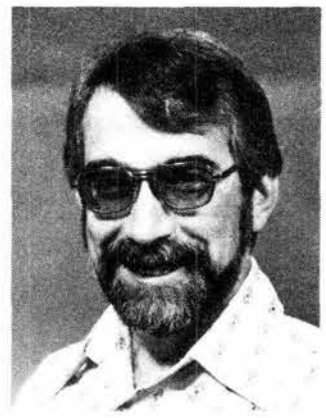

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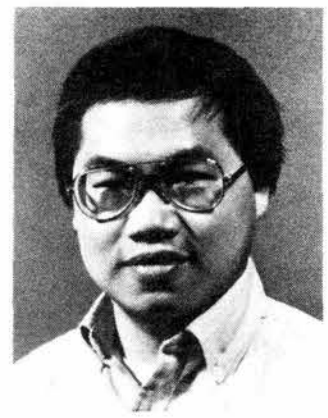

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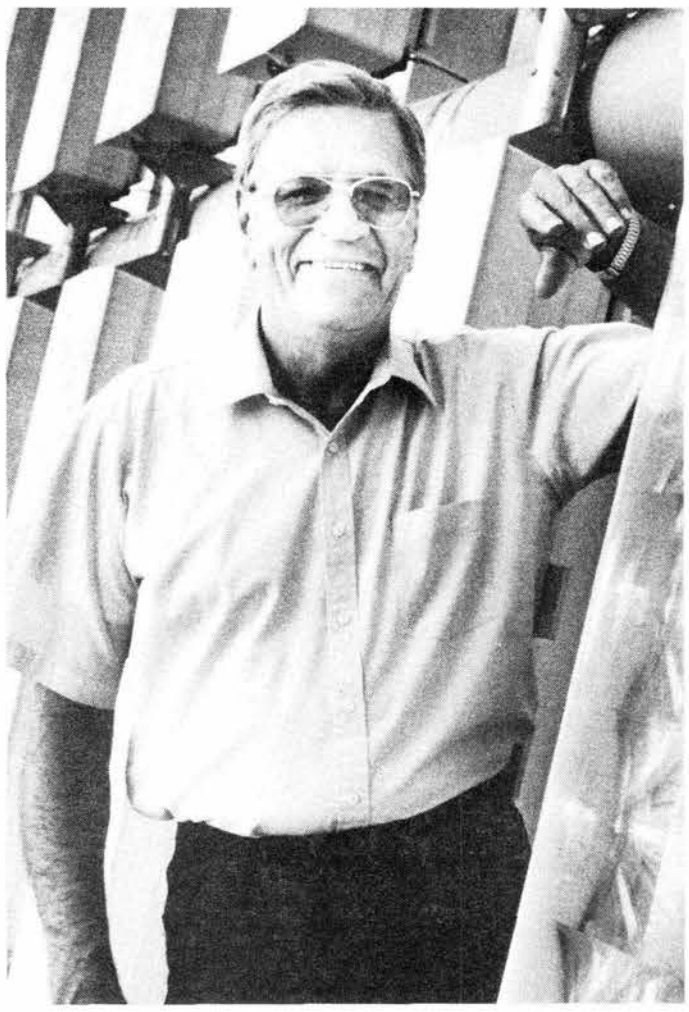

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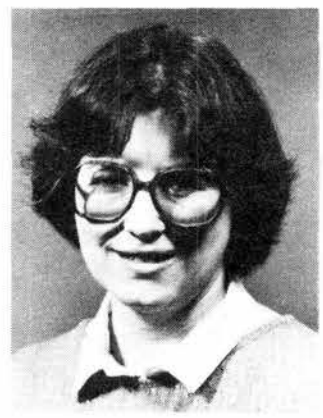

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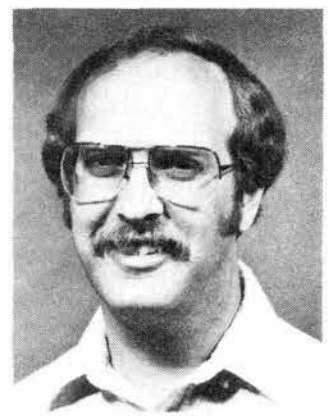

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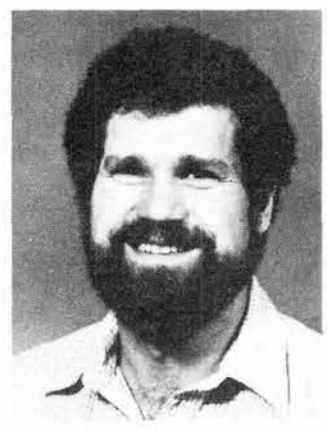

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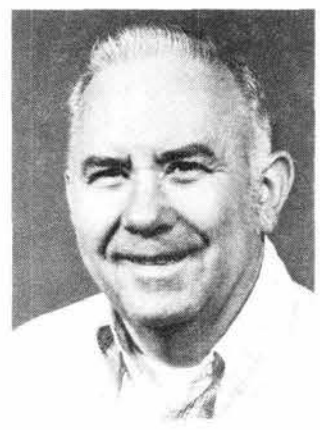

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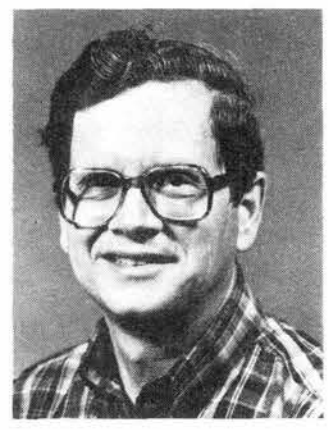

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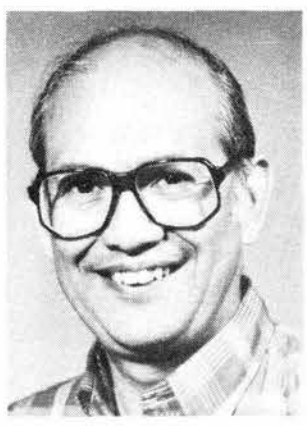

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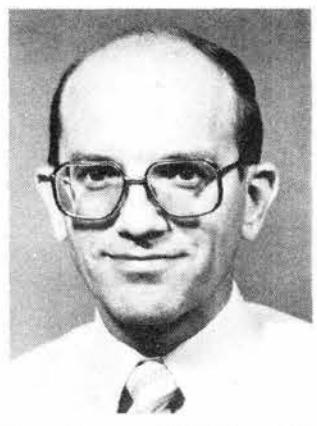
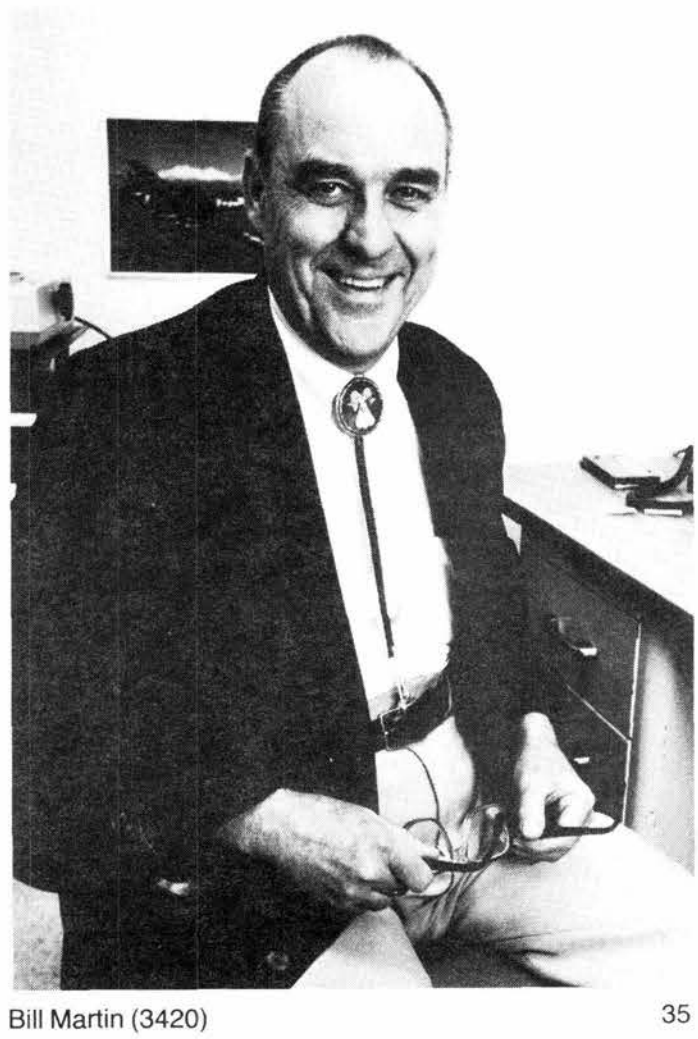
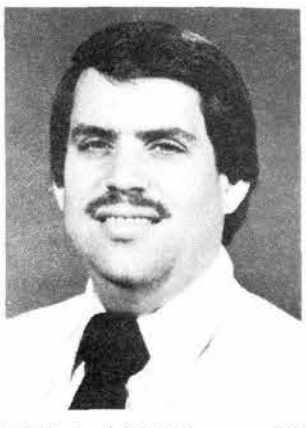


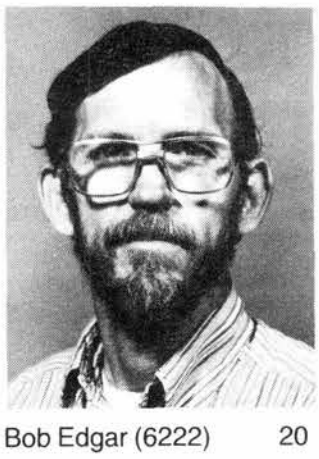
Dave Larson (1513) 20



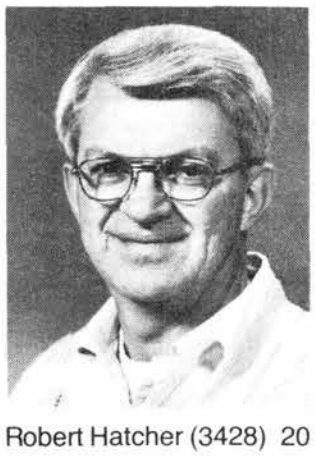
Bill Martin (3420) 35



Art Ratzel (1513) 10



Bob Edgar (6222) 20



Robert Hatcher (3428) 20

Deadline: Friday noon before week of publication unless changed by holiday. Mail to Div. 3162.

Ad Rules

1. Limit 20 words, including last name and home phone.
2. Include organization and full name with each ad submission.
3. Submit each ad in writing. No phone-ins.
4. Use 8½ by 11-inch paper.
5. Use separate sheet for each ad category.
6. Type or print ads legibly; use only accepted abbreviations.
7. One ad per category per issue.
8. No more than two insertions of same ad.
9. No "For Rent" ads except for employees on temporary assignment.
10. No commercial ads.
11. For active and retired Sandians and DOE employees.
12. Housing listed for sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

35MM SLR OUTFIT, Honeywell Spotmatic; lenses: 55/1.8, 28/2.5, 85-205/3.8; leather case; $100. Shane, 294-4920.

OAK PLYWOOD, 4-3/4", 2-1/4" sheets; 120 ft. 1" x 2" oak cabinet facing; 500 ft. 3/4" oak screen bead for tambour roll; best offer. Hellmann, 821-0357.

ELECTRIC RANGE, Orbon, almond, $45. Sparks, 884-7376.

TURNTABLE, Dual 510 semi-manual, belt driven, w/new Ortofon cartridge worth $75, all for $95. Brosseau, 294-4731.

TAKUMAR LENSES with 49mm screw mount for Pentax: 135mm telephoto, 35mm wide angle, $125; Vivitar auto flash, $20. Mazze, 299-4568.

MOTORCYCLE HAULER, Trail-A-Bike, mounts on hitch tongue, holds front wheel, rear rolls, for bikes under 300 lbs., $35. Schkade, 292-5126.

HE-MAN, Masters of the Universe collection, reasonable prices. Borkenhagen, 881-9357.

SPALDING CANNON metal driver, 11° Aldila boron graphite shaft, new $95, sell for less. Zownir, 256-3753 or 256-3717.

KING SIZE WATER BED, four-post cannon ball design, dark stain, w/accessories, $175. Laird, 298-5359.

COMPUTER C-64, 1702 color monitor, 1541 disk drive, fast load cartridge, Easy Script word processor, $475. Shepherd, 299-9066 after 5:30.

19-1/2' TRAVEL TRAILER, self-contained, $2900; camper shell LWB, $170; lady's bicycle, 26", $55; exercycle, $18. Mata, 898-3377.

MIRANDA SENSOREX 35mm SLR camera, 28mm f2.8 wide angle, Soligor 90-230mm f4.5 zoom, best offer. Novotny, 296-7167.

HANG GLIDER, 215 ft.2, little-used, $200. Ginn, 883-0004.

TWO KITCHEN TABLES, 4 chairs/ea., $35/set; 8 tubeless nylon Homaster mobile home tires w/rims 7-14.5, $160 OBO. Hochrein, 268-9204.

SLEEPING BAG, Eddie Bauer, large, rectangular, down, $110; Craftsman router, $50; tachometer S-W, $35; Jaguar E-type wheel spindles. Gubbels, 884-3711

WASHER, DRYER, electric, Sears Kenmore laundry pair, 1-1/2 yrs. old, $400. Sceiford, 298-6396.

ROPER DELUXE electric range, self-cleaning oven, microwave on top, used 4 months; 10-spd. bike, 26". Palmer, 296-2551.

10 MEGABYTE AT&T add-on hard disk with controller for AT&T 6300 computer, $350. Allshouse, 296-2276.

CONSTRUCTION POWER POLE w/ weatherhead, conduit, wire, meter base, switch and outlet boxes, $50. Meikle, 299-4640.

XEROX 820 PC assembled from surplus parts, Z80 CPU, 64K RAM, dual drives, software, $350 OBO. Brown, 821-4494.

CHILD'S STROLLEE "Wee Care" car seat, $25. Noel, 884-4491.

SERVICE MANUAL for '81 Pontiac Phoenix, $10; Chilton's 1975-1981 Automotive Service Manual, $10. Baca, 296-8474.

21" TORO LAWN MOWER, self-propelled, f§ront wheel drive, rear bagger, 4-cycle Tecumseh engine. Palmer, 299-4722 after 6. GOLF CLUBS, men's size, 2 PW irons; 1, 3, and 4 woods; $100. Harrison, 292-6856.

SEARS 14 FT. FROSTFREE refrigerator, freezer on bottom, coppertone, make offer. Jewell, 293-4838.

384K MEMORY BOARD for IBM PC or compatible computer, fully stuffed, $75. Risse, 869-2037.

CAR TOP CARRIER, electric grinder, metal utility cabinet, nylon double air mattress, toaster, lady's size 9 all-weather coat. Levan, 821-0980.

MICROWAVE OVEN HOLDER/CART, O'Sullivan, $35; 3 bookcases, $5/ea.; portable stereo phonograph, detachable speakers, $25. Robertson, 299-7561.

MIRROR, 3' x 4' x 1/4", good for bathroom. Martinez, 821-6096.

19" RCA COLOR TV, $125; 19" Sharp color TV, $75; Garcia classical guitar, $125; sewing machine, $100 OBO. Rutledge, 268-3262.

COLT AR-15 plus 3 clips, $325. Smith, 281-2083 or 881-6793.

35MM SEARS/RICOH automatic SLR w/f1.4 lens, 2 zoom/macro lenses, other lenses and accessories included, $390 complete. Womelsduff, 255-5028.

RECLINER, large, brown vinyl; GE canister vacuum w/attachments; lamps, pole, vanity; braided rugs: hall 2' x 9', oval 3' x 6'. Easton, 256-7717.

SILVER SERVICE w/tray, silver flatware service for 6, wrought iron telephone bench. Pinkerton, 255-2505.

ALL-WOOD DROP LEAF KITCHEN TABLE and 2 chairs, $125; 19" Sharp color TV, $50; coffee table, $25. Wasung, 266-6088.

BEDROOM SET, dresser w/mirror, night stand, 4-drawer chest, head board, double bed mattress and frame, $550. de Souza, 266-4272.

SEARS 21" PUSH-TYPE LAWN MOWER, 2 yrs. old, price negotiable; 2 glass shower doors for bathtub, $10. Kindschi, 256-0531.

RV AWNING, 17' A&E8000, new, still in box, $525 OBO. Fine, 268-4491.

LAWN MOWER, electric, long extension cord, $70. Whitehurst, 299-0153.

REFRIGERATOR, GE, harvest gold, frost-free, $150; 2 vacuum cleaners, Kirby upright, $40, Sears canister, $25; table lamp, $25. Byers, 298-8326.

BAR STOOLS, 3, $12/ea.; decorative fireplace w/electric heater, $20; Bridgestone trail bike, 100cc, $225; 14", 4-hole wire-basket wheels, 4, $25/ea. Nagel, 298-2779.

EXECUTIVE CHAIR, gray, low back, $30. Montoya, 881-6898.

GE PORTABLE ROTISSERIE broil oven, $15; sprinkler hoses, $2/ea.; Rainjet sprinkler heads w/risers, $1/ea.; 5-gal. cans, $3/ea. Mills, 299-2130.

GERMAN SHEPHERD PUPS, AKC registered, shots, dewclaws removed, black, 2 males, 1 female, $175. Midiette, 897-4318 after 6.

VISTALINER POP-UP CAMPER, '69, sleeps 6, 3-burner stove, icebox, sink, reinforced frame. Oravecz, 281-3667.

SOMMA FLOTATION MATTRESS SET, queen-size, $75; girl's 20" bike, $25. Westfall, 884-8701.

WINE WOOL CARPET, 10' x 11', $25; Coleman 2-burner camp stove, $18; trailer wheel w/tire, 4.80/4.00-8, both new, $27. Horton, 883-7504.

WHITE WESTINGHOUSE WASHER, originally $340, will sell for $240; Sears Kenmore electric dryer, $50; both for $250. Naru, 275-1029.

ROTOTILLER, Wards, 5-HP, $325; 3kW generator, Dayton, 3W352, never used, $550; drill press milling table, $125. Schuler, 821-8944.

BABY FURNITURE: crib w/mattress, 5-drawer chest, playpen, high chair, stroller, tub, etc., $200 set. Sutherland, 345-1183.

ROCKHOUND SPECIAL: new 10" trim saw, Highland Park model 10TS-B, 2 diamond blades, splash cover, cutting fluid, $295. Womelsduff, 255-5028.

RANGE HOOD, Sears Best, stainless steel, variable speed, paid $249, sell $65. Barton, 268-7349.

BELL & HOWELL MOVIE CAMERA, $65; refrigerator, $100; living room chair and ottoman, $85. Falacy, 293-2517.

DECORATOR DRAPERY ROD, antique brass, left pull, 7'-9', $15 OBO. Lennox, 821-0474.

RED PATIO BLOCKS, 1' x 1' x 2", used, have some concrete adhering, 40¢ ea. Greenwood, 298-5268.

3-PIECE LIVING ROOM SUITE, maroon, 6 months old, $165. Turner, 294-9674.

GOLF CLUBS AND BAG, $40; Sears 25" color console, $50; car ramps, $10. Ishimoto, 821-6518.

REMODELING SURPLUS, $25 will buy choice: woodfold 40" door, Sears garage door opener, 3 8' fluorescent fixtures ($10/ea.). Atkins, 298-5762.

DEPTH FINDER, Humming Bird Super Sixty, used one season, $50; used 36" chain link fence, make offer. Liguori, 256-3613.

FILING CABINET, steel, 4-drawer, $75. Orear, 256-1941.

FREE MOVING BOXES, mostly photocopy paper boxes w/lids. Hovorka, 299-0224.

TRANSPORTATION

'72 FORD PICKUP, new paint; '74 Audi Fox, new paint; will sell both for $1800. Carrillo, 292-7283.

'57 CHEV., SW, 4-dr., $2500 OBO. Pierce, 299-2801.

'82 MAZDA RX-7 GS, AC, sunroof, aluminum wheels, AM/FM stereo, 35K miles, $7500. Riley, 821-1949.

'82 TOYOTA, 63K miles, AM/FM cassette, 4-spd., blue, just tuned up, $3700. Hovorka, 299-0224.

'77 CHEVETTE, 79K miles, 4-spd., one owner, $950 OBO. Allen, 823-2947.

'72 VEGA HATCHBACK w/Olds. 215 CID V8, many extras, $795 OBO. De La Plain, 293-9359.

'85 NISSAN PULSAR, 11K miles, AC, PS, PB, red. Muller, 883-4321.

'71 VW BUG, $1000 OBO. Bechdel, 293-8709 after 5.

'84 PONTIAC FIERO, white, 6K miles, $7000. Knudson, 298-6297 after 5:30.

'79 CUTLASS SUPREME, $600, take over payments. Valdez, 867-9048 after 6.

'80 HONDA XR500 trail bike, $550 OBO. Kolb, 294-5860.

'76 AUDI FOX station wagon, 27-30 mpg, $1450 OBO. Thorn, 892-7944 after 6.

WINDSURFER, high-performance AMF Tiga Funcup, full battens, retractable center board, $475. Ginn, 883-0004.

'72 FORD F-100 pickup, 390 engine, AC, AT, PB, custom shell, trailer hitch, 47K miles, $2000. Tolmie, 881-6640.

'65 MUSTANG CONVERTIBLE, automatic. Montoya, 821-5189.

SAILBOAT, '76 South Coast 22, pop top, swing keel, sleeps 5, 5 HP outboard, trailer, $5200. Bouton, 898-3562.

'80 DATSUN, 310GX HB, new brakes. Fenimore, 298-8052.

'82 KOMFORT TRAVEL TRAILER, 20', self-contained, extras. Velarde, 291-9354.

'83 MAZDA 626LX, AT, AC, AM/FM cassette, sunroof, cruise, power windows, locks, mirrors, 38K miles, new tires, $7500 negotiable. Hellman, 821-0357.

'53 WILLYS JEEP, tow bar, roll bar, new brakes, generator, and exhaust. Palmer, 299-4722 after 6.

'78 KAWASAKI KE 175 on/off road motorcycle, 3000 miles, helmet included, $375. Dobranich, 298-4547.

'74 CHEV. MONTE CARLO, radials, PS, PB, PW, tilt wheel, Blaupunkt AM/FM cassette stereo, $1200. Harrison, 292-6856.

'72 CHEV. SUBURBAN, 4-wheel drive, PS, PB, 350 V8, new AT, needs valve work, $1100. Hawkinson, 281-1281.

'77 CHEV. 1/2-TON PICKUP, 8' bed, PS, PB, automatic transmission, recent overhaul, $2195 OBO. Pitcher, 292-4091 after 4:30.

'82 FIREBIRD, automatic, air, power steering/brakes, low mileage, AM/FM cassette, T/A radials, cruise control, $5900. Nickerson, 299-3101.

'83 HONDA ODYSSEY, 4-wheel ATV, $1000; 4-into-1 exhaust system for V-45 Magna (Supertrapp). Grasser, 292-3799 or 291-0947.

'78 HONDAMATIC CB400, blue w/white windjammer and saddlebags, new tires and battery, $1100. Martinez, 821-6096.

'75 JOURNEY MOTORHOME, 22', Class A, rebuilt engine and transmission, 440 Dodge, has everything, $10,500. Precit, 296-5262.

'81 DATSUN, 310, 1 owner, low mileage, $3000. Bremer, 821-6088.

'78 HONDA GOLD WING w/Equalean side car, extras. Johnston, 294-4574.

TOURMAX CARLISLE MT90S16 MOTORCYCLE TIRE, ideal for Gold Wing or other large tourer, new with guarantee, $70. Baca, 298-7748.

'82 COLLECTOR'S EDITION CORVETTE, power everything, 350, glass tee tops, champagne, appraised at $17,700, asking $17K. Morris, 296-8680.

'85 CADILLAC SEDAN DEVILLE, almost 2 years old, 44k miles, check NADA, make offer. Schubeck, 821-3133.

'85 GMC HIGH SIERRA 1/2-TON PICKUP, loaded, low mileage, under warranty, $12K OBO. Sobering, 292-5322.

'75 BRONCO, 3-spd., V8, PS, AM/FM cassette, new paint, extras, $3600. Cook, 869-6921.

YAMAHA MOPED, 49 cc, low mileage. Altwies, 292-3884 after 5.

'57 CHEV. PICKUP, most major parts recently replaced, ideal for restoration, $2400. Turner, 294-9674.

'86 NISSAN PICKUP, red w/gold stripe, tinted windows, 5-spd., 5,000 miles, factory warranty. Scheibner, 268-0344 after 5.

'74 CORVETTE, 350 V8, AT, $6500. Gentry, 298-3574.

'66 ECONOLINE VAN, pearl paint, mag wheels, stereo, 50K rebuilt, $995 OBO. Brewster, 884-8312.

'84 FORD RANGER, 4-cyl., 5-spd., 28K miles, fiberglass cap, wrangler tires, AM/FM stereo, $5000 OBO. Foltz, 291-0051.

'82 HONDA MOTORCYCLE, GL500I, $1800 OBO. Husa, 298-5764.

'69 HONDA TRAIL 90 MOTORCYCLE, bumper mount, motorcycle carrier, $250. Lukens, 299-1271.

'77 APOLLO MOTORHOME, 30', rear double bed, loaded, below NADA book price. Fine, 268-4491.

'73 BRONCO 4X4, 302 cu. in., AT, PS, AC, $3995 OBO; '79 Yamaha motorcycle, 650cc, w/windjammer, $950 OBO. Sanchez, 294-4604 after 4.

'76 CHEV. MONZA, 2+2, 4-spd., rebuilt engine, $850. Ellison, 892-3662.

84 PONTIAC 6000-LE WAGON, 24K miles, AC, PW, 6-cyl., power locks/mirrors, third seat, more, $8900 OBO. Westfall, 884-8701.

'73 PONTIAC CATALINA 400, 4-door, needs work. Widenhoefer, 298-2510.

'84 VOLVO 760GLE, electric sunroof, cinnamon metallic finish, beige velour interior, loaded. Brown, 293-6103.

'81 KAWASAKI 750 LTD, low mileage, $1000 OBO. Montoya, 881-6898.

'80 OLDS CUTLASS, 2-dr., V8, loaded, tape deck, sport wheels, 53K miles, retail $4125, sell "average trade" $3400. Morgan, 299-2020.

'76 TOYOTA CELICA, 4-spd., manual transmission, $1300 OBO. Whitehurst, 299-0153.

'78 YAMAHA XS650, low mileage, extras, $750. Mills-Curran, 822-1610.

REAL ESTATE

VOLCANO CLIFFS, 90' x 150' lot, Carousel N.W., closing cost down w/real estate contract, $15,900. Mazze, 299-4568.

2 ACRES BOSQUE FARMS, w/3-bdr. house, 3-car garage, screened porch, barn, corrals, irrigated pasture. Beall, 869-2939.

41 WOODED ACRES, Manzano mtns., borders on road, 3 miles west of Torreon, 1 hr. from Albuquerque. Stearns, 298-0444.

1-ACRE WOODED LOT, Pine Crest (Canyon Estates area), 15 min. from base, low down, negotiable terms. Beraun, 292-5815.

3-BDR. ROBERSON near Juan Tabo and Menaul, 1775 sq. ft., 1-3/4 bath, double garage, pitch roof, fireplace, storage bldg., sprinklers. Dyer, 299-5324.

4-BDR. HOME, 2 full baths, 2-car garage, 15' x 20' family room, large kitchen, 2 x 6 construction, landscaped, Rio Rancho, $81,500. Menschel, 892-4854 evenings.

3-BDR. HOME, den/study/office, near Winrock and Coronado. Zucuskie, 881-4086.

ACADEMY AREA, 3-bdr., 1-3/4 bath, brick front, sprinklers front and rear, Heritage Hills, $89K. Hall, 299-0009.

BOSQUE FARMS, 1/2-acre, 3-bdr., 2-bath, great room w/fireplace, 1790 sq. ft., screened patio, large garage, landscaped, fenced. Cook, 869-6921.

MOBILE HOME, '80 Centennial, 14' x 50', 2-bdr., carpeted, energy efficient. Williams, 281-3844.

NE FOOTHILLS, 4-bdr., 1 full bath, two 3/4-baths, 5-zone heat, oversize garage, large cul-de-sac lot w/access, large patio. French, 293-3451.

CEDAR CREST HOME, 2 acres, N14 frontage, 2-bdr., 2-bath, great room, guesthouse, 2-car garage, water. Carson, 281-5115.

WANTED

MOTORHOME to rent for vacation third week in August. Seamons, 298-5683.

SLIDE PROJECTOR, 2 1/4 X 2 1/4; stereo camera; stereo projector; 45-70 Ruger rifle; digital tuning AM/FM/SW receiver. Mattox, 292-7763.

FOUR TIRES, 14" bias-ply or steel belted, 225x14 or 215x14, reasonable condition. Carrillo, 292-7283.

DRAFTING MACHINE, small table preferred, but any size acceptable. Sanchez, 294-4604 after 4.

WORK WANTED

YARD MOWING and hauling during the summer, free estimate. Lanes, 299-6298.

HOUSESITTING, during your vacation by college junior, references. Cook, 296-3064.

Pops Party Set for June 15

KING FOR A DAY — That's your Dad if you treat him to the big a la carte buffet served at the C-Club patio June 15. The menu (available from 11-4) features grilled steaks, hot dogs, hamburgers, BBQ beef, baked beans, french fries, and assorted salads . . . and Pop doesn't have to do the outdoor cooking this time around! Plan to make a day of it — the Isleta Poor Boys entertain from 2-6, and there's plenty of time to swim, play volleyball or horseshoes, or just relax under a shade tree.

PIXIE THE CLOWN will entertain and Lassie will come home at Family/Variety Night tomorrow night, June 7. A low-cost buffet with pizza, hot dogs, hamburgers, french fries, and a salad bar starts at 5 p.m. Pixie treats the kids to some hilarious entertainment and magic from 5:30-6, and that classic tear-jerker, "Lassie, Come Home," fills the big screen at 6:15. As always, the movie is free.

A McENROE OR EVERT-LLOYD you may not be, but here's your chance to learn the basics or sharpen those court skills. The C-Club offers adult tennis lessons in three sessions this summer: June 2-26, July 7-31, and Aug. 4-28. Classes meet twice a week — beginners from 6-6:45 p.m., and intermediates from 6:45-7:30 p.m. Cost for a four-week session is $24, and any C-Club member is eligible for sign-up. Call the Recreation Office (4-8486) to enroll.

THAT EVER-POPULAR SUNDAY BRUNCH is back in the spotlight June 8 from 11 a.m.-2 p.m. The buffet features ham, sausage, baron of beef, scrambled eggs, hash browns, green chile salsa, fruit salad, salad bar, and more — all for the unbelievably low price of $4.95. Children under 12 eat at half price. Call the Club office (265-6791) right now for reservations.

OK, YOU DON LESMAN FANS — Here's your chance to swing and sway to your favorite mellow big band sound! It all happens next Friday night, June 13, from 8-11:30 in the ballroom, following a $6.95 buffet featuring baron of beef and mahi-mahi, along with a full salad bar. The following Friday (June 20), it's your choice of filet mignon or fried shrimp — two dinners for $14.95. Afterward, dance to the country/western strains of the Isleta Poor Boys from 8-12. Be sure to call for reservations on these two, or for any other time you're planning to eat at the Club.

THE NEXT ETHNIC BUFFET (aka "the sauerkraut special") features German food, served from 6-8 p.m. on Tuesday, June 17, for $6.95. The Edelweiss Dancers entertain from 7-7:30 that night to get you in the mood for some lively dancing to the music of the Rhythm Airs from 8-11. Better oom-pah-pah your way over to the Club office to reserve your space for this one.

CORONADO AQUATIC CLUB members plan to perform swimmingly at their four meets this month! Come out and cheer them on at away meets on the 14th and 19th (Four Hills CC and Sandia Heights, respectively) starting at 9 a.m., and home meets on the 21st and 28th (Albuquerque CC and Paradise Hills) starting at 8:30 a.m.

SINGLES WILL MINGLE on Thursday, June 19, right after work at the Club. Free munchies from 5-7, and the usual low price draft beer and margaritas all evening. Dance to the music of the invincible Vince & Sounds Unlimited from 7-10. Go where the action is; mark your calendar right now!

A TRAVEL FAIR, hosted by the C-Club Travel Committee, is coming up Tuesday, June 24, starting at 5 p.m. You can get specific information on all trips scheduled for the remainder of '86 at tables manned by committee members. Also — get the lowdown on a terrific 1987 trip schedule. Here's a fine opportunity to plan ahead on that vacation schedule. More details next issue.

SPEAKING OF TRAVEL, some pretty special trips are in the offing, courtesy of the travel committee. This group prides itself on painstaking planning down to the last detail. Some soothing sojourns coming up:

Southern Colorado — No more dawdling on this one! Reservation deadline is next Wednesday, June 11. Head for cool Colorado July 11-13. You'll tour cliff dwellings at Mesa Verde, live it up in beautiful downtown Durango for two nights at the new Rodeway Inn, ride the narrow-gauge train from Durango to Silverton, experience the thrill of the Alpine slide at Purgatory, and much more. The $176/person tab covers (besides the above) charter bus fare, all kinds of meals (including a big Bar-D BBQ dinner and Western show in Durango), snacks and drinks on the bus, two cocktail parties, and all taxes/tips on included items.

The Ozarks — You'll enjoy a riot of fall color in the Ozarks for seven days in October (18th-24th), and visits to many of the region's other attractions during this escape from the ordinary. Included are stops at some outstanding museums: Gilcrease Museum (Tulsa), with its great collection of western art; Cherokee Museum (Tahlequah, Okla., capital city of the Cherokee Indian Nation); Miles Musical Museum (Eureka Springs, Ark.). Other fine entertainment along the way includes a rip-roaring Ozark hillbilly music show in Eureka Springs; the Great Passion Play (comparable to the one in Germany, we hear); Silver Dollar City (Mo.), a commercial replica of an Ozark pioneer settlement where every conceivable craft is demonstrated — and available for purchase; and the Shepherd of the Hills outdoor drama (Silver Dollar City area). All these outstanding attractions are included in the $637/person price, along with round-trip air fare to Tulsa, six nights' lodging, deluxe motorcoach transportation, two special dinners, and all admission fees. Reservation deadline is Sept. 15.

Laughlin/Lake Havasu City — This one is for all you closet gamblers who just can't wait to hit the gaming tables in Laughlin (Nev.), and for all you historian types wanting to learn more about our English heritage. The English heritage experience comes by way of a visit to Lake Havasu City, where you can see the one and only London Bridge, smack dab in the middle of the Arizona desert! This trip, action-packed from start to finish, takes you away from it all Oct. 13-16. The $150/person fee includes three nights' lodging at Laughlin's elegant Edgewater Casino/Hotel, one free breakfast or lunch buffet of your choice, round-trip motorcoach fare (and refreshments along the way), and one free "fun book." Don't ask *us* what a fun book is; ask travel honcho Marv Plugge! Better move fast on this one — it's limited to one busload of people. Aug. 12 is the reservation deadline, but you might be shut out if you wait until then.

Events Calendar

May 23-June 8 — "A Doll's House: A Chicana Story" (adapted from Ibsen for NM audiences); 8 p.m. Fri.-Sat., 3 p.m. Sun.; La Compania de Teatro de Alburquerque, Nuestro Teatro (3211 Central NE), 256-7164.

June 6 — Summerfest, Friday Evening Gala: "Tony Brown and Company"; 5:30-9 p.m., Civic Plaza.

June 6-15 — "The Heart Outright" by Mark Medoff; New Mexico Repertory Theatre; 8 p.m. Tues.-Sat., 2 p.m. matinees Sat. & Sun.; KiMo, 243-4500.

June 6-7 — "Cinderella," ballet; 8 p.m., Albuquerque Little Theatre (224 San Pasquale SW), 265-8150.

June 6-29 — "School for Scandal," lampoon of manners, mores, and the mannered; 8 p.m. Fri.-Sat., 6 p.m. Sun.; Vortex Theatre (Buena Vista & Central), 247-8600.

June 7-Sept 30 — Exhibit, Ye'ii, Ye'ii Bichai and Navajo dry painting ceremonial tapestries; 9 a.m.-4 p.m. Mon.-Fri., 10 a.m.-4 p.m. Sat.; Maxwell Museum of Anthropology, UNM, 277-4404.

June 7 — Fashion show featuring "Emel" and the Marquis Connection, 7:30-9 p.m.; School End Bash DJ dance, 9-11 p.m.; South Broadway Cultural Center, 848-1320.

June 7 — Summerfest, Greek Night on the Plaza; 5-11 p.m., Civic Plaza.

June 9-14 — Movie: "Indiana Jones and the Temple of Doom"; 3:30 p.m. (6:30 p.m. June 11); South Broadway Cultural Center.

June 12 — Summerfest, Noontime Concert: "Fiasco Brothers" bluegrass music; 12-1 p.m., Civic Plaza.

June 13 — Sandia Pueblo Feast Day, call 867-2876.

June 13 — Summerfest, Friday Evening Gala: "Big Band" live; 5:30-9 p.m., Civic Plaza.

June 13-29 — "Crime on Goat Island" by Ugo Betti; 8:30 p.m., Corrales Adobe Theatre, 898-3323.

June 13-15, 20-22, 27-28 — "Damn Yankees"; 8:15 p.m., 2:15 p.m. Sun.; Albuquerque Civic Light Opera, Popejoy Hall; 345-6577.

June 14 — Summerfest, Native American Festival; 4-10 p.m., Civic Plaza.

June 15 — Movietime at the KiMo, Boy Meets Girl Series: "Henry V" (1945), starring Lawrence Olivier; 7 p.m., KiMo.

June 19 — Summerfest, Noontime Concert: "Los Bohemios" troubadour music; 12-1 p.m., Civic Plaza.

June 19 — Classical Music of India, 8 p.m., South Broadway Cultural Center, 848-1320.

June 20 — Summerfest, Friday Evening Gala: "AMIGAS y su Grupo Ritmo" (Tex-Mex, rock, variety); 5:30-9 p.m., Civic Plaza.

NO TRADITIONALIST, SHE — In March, Betty Lord became the first woman to sign on in Transportation Section 3423-1 as a truck driver (utility). She's authorized to drive vehicles up to three tons, according to her boss, Jim Davis. Betty joined the Labs as a messenger in April 1982. Before she moved to her current job, she was a dock worker in Shipping and Receiving Division (and was one of the first women in that job too). "A second woman truck driver has joined our group since Betty got on board," reports Jim.